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DELIRIOUS STATES*

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The word "delirium" is derived from *de*, meaning "out of," and *lira*, the ridge between two furrows on ploughed land, and its original signification was therefore "off the track." Metaphorically it was used to denote any form of mental aberration, and this wide meaning of the term has to some extent persisted to the present day. Notably in French *délire* is used in a far more general sense than in English, and is applied not only to delirious processes in the English sense, but to delusions and obsessions. In the present paper the word is used in its narrower meaning, though even here, as we shall see, its signification is by no means so precise and limited as is sometimes supposed.

Numerous problems worthy of discussion arise in connexion with the consideration of delirious states. Do these states belong to a precise and definable syndrome, with a specific causation and mechanism? Do the deliria resulting from different causal agents present specific features, so that the nature of the agent can be inferred with certainty from the clinical picture? What part do constitutional and psychogenic factors respectively play in the causation of deliria? Does the study of delirious states enable conclusions to be drawn concerning the origin and mode of production of psychotic symptoms in general? Further, there are practical problems of diagnosis, prognosis, and treatment. Naturally it will only be possible here to touch upon the fringe of this great field, and many interesting and important topics must be omitted altogether.

Definition

The term "delirium," when applied to specially selected and characteristic examples such as febrile delirium, denotes a familiar syndrome, apparently composed of precise and easily recognizable features. Clinical observation, however, has made us acquainted with a series of allied states, ranging by imperceptible gradations from the typical febrile delirium to clinical pictures of a very different nature, and the existence of this graded series makes it difficult to mark out any precisely defined syndrome to which the term "delirium" may be properly and exclusively applied. This difficulty is apparent when we seek, in text-books and elsewhere, for a satisfactory definition.

Bleuler[1], after explicitly recognizing that delirium, though a concept everywhere used, is differently defined by different authors, and is not clearly differentiated or definitely limited, remarks that "what one calls *deliria* are mostly states of incoherent thinking combined with hallucinations and delusions, which show a certain activity and run a rapid course." Henderson and Gillespie[2] define delirium as "a symptom-complex consisting essentially in disorientation and hallucination, and very commonly having an accompanying affective disturbance, especially of fear." Levin[3] says that "empirically, delirium may be defined as a condition in which the patient is restless, lacking in alertness, disorientated and hallucinated." Wolff and Curran[4] equate delirium in a broad sense with Adolf Meyer's "dysergastic reaction," a term proposed by Meyer for the disturbances "due to disorders of the nutrition and circulatory support of the brain (the effects of poison or abnormal nutrition, anaemia, hyperaemia, and oedema)." Curran[5] divides organic mental disorders into those which show an irreversible alteration in brain tissue, and those which do not, and he employs the term delirium to designate a group lying within this second class, a group "not perhaps strongly defined," but characterized, "amongst other things, by considerable confusion and disorientation."

It has to be confessed that these definitions are vague, and they certainly fail to mark out any syndrome characterized by precise and sharply limited features. We may conclude, indeed, that no such precisely marked syndrome exists, although it may nevertheless be possible to show that certain phenomena tend to occur in association with one another even in very diverse settings, and that from this constancy of collocation certain inferences may be drawn.

Range of Delirious States

It has been remarked above that, while febrile delirium forms an easily recognizable and characteristic syndrome, a series of states can be found which range by imperceptible gradations from this typical picture to conditions with apparently remote relations to febrile delirium. Tracing out this series of states, we have in the first place the disorders to which the term delirium is unhesitatingly and universally applied, the deliria resulting from the abuse of drugs, notably alcohol. Delirium tremens, with its confusion, disorientation, hallucinations, associated fear affect, and short course, conforms in all respects to a typical delirium, but it is to be noted that we find a range of cases proceeding from what may be called an attenuated delirium tremens, with less severe symptoms and a longer course, through the conditions which have been termed alcoholic hallucinosis, to chronic hallucinatory psychoses in which some of the characteristic features of delirium such as confusion are almost entirely lacking. Chloral hydrate is capable of producing a disorder symptomatically identical with delirium tremens, and numerous drugs—bromides, cocaine, and many others—may be responsible for closely similar clinical pictures.

Next we have those conditions in which an endogenous toxic process may reasonably be presumed to be operative. Febrile delirium of course itself belongs here, and in addition

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typical delirious states may arise in illnesses which may or may not be accompanied by fever, such as uraemia. Here also should be mentioned the deliria which may precede the outbreak of an infectious disease or occur during its post-febrile period, and perhaps post-operative deliria and those sometimes manifested in states of extreme inanition. In the next group may be comprised those cases in which the assumption of a toxic origin is based mainly on analogy, such as the deliria occurring in senile psychoses, general paralysis, and in traumatic conditions, though, as we shall see when considering the theories put forward by Hughlings Jackson, the assumption may be erroneous.

We then have to deal with a series of cases which, while certainly not conforming to the typical picture of a delirium, present obvious similarities thereto, and include in their symptomatology the confusion, restlessness, and hallucinatory tendency which seem to be the essential features of delirium. It will not be amiss, indeed, to regard these states as attenuated deliria. Here belongs the acute confusional insanity of English psychiatrists, a clinical entity originally described by Meynert under the name of amentia, and then by Chaslin under the name of primary mental confusion. This condition is characterized by confusion with imperception and disorientation, hallucinations of all the senses, motor restlessness, a duration of several months, and a fairly good prognosis. The apparent causation of these cases is particularly interesting because, while on the one hand the disorder may follow definite toxic states either exogenous or endogenous, it may also occur as a sequel to excessive fatigue, and emotional stress. It is a plausible inference to suppose that the link is by way of chemical processes associated with the fatigue or emotional state.

Next, certain considerations may be mentioned which indicate clearly the difficulties encountered in regarding delirium as a definite syndrome with specific characters, relationships, and causation. The first is the circumstance that typical deliria may occur in the course of other disorders such as schizophrenia, and that these manifestations shade imperceptibly into symptom-complexes characteristic of those other disorders but not of deliria. The second is that deliria may occur in psychogenic disorders such as hysteria. These might be regarded as resulting from the associated emotional states in the manner described above, but we are met with the further difficulty that such deliria shade into the so-called "twilight states," such as hysterical somnambulisms, in which elaborate and coherent thought-processes and behaviour occur, without obvious affect, and without anything that can reasonably be called confusion.

Finally it has to be noted that the clouding of consciousness to which the term confusion is applied may in deliria show varying grades of depth. There may simply be a mild impairment of comprehension, and some interference with the co-ordination and elaboration of impressions. If the disturbance deepens, a state develops in which hallucinations and delusions may easily be formed. A further deepening leads to a condition of somnolence and ultimately to coma. The consideration of this type of grading points to a significant relationship between the confusional phenomena of deliria and the mental torpor observed in conditions of increased intracranial pressure such as occur with cerebral tumours.

How Far is "Delirium" a Unitary Syndrome?

We are now in a position to consider how much unity the syndrome "delirium" possesses, and how far essential features can be picked out therein which, when found similarily collocated in diverse settings, enable definite inferences to be drawn concerning their causation and pathogenesis.

Curran[3] in a study of 103 cases, of very diverse origin, endeavoured to determine, amongst other problems, the characteristics which delirious states appeared to possess in common. He found that confusion (difficulty in grasp, and clouding of consciousness), and restlessness (ranging from highly co-ordinated and apparently purposive movements down to simple movements barely distinguishable from tremor), were universally present. In addition the patients responded with abnormal facility and intensity to stimuli arising from without and within, unless the disorder was so profound as to border on coma. Visual hallucinations were very frequent, as were also delusions or misinterpretations of paranoid type. Curran holds that "confusion," if the term is correctly used and not loosely applied to any case which does not respond briskly and appositely, such as retarded depressives or patients showing schizophrenic perplexities, is only found in definitely organic reactions.

Henderson and Gillespie[2] adopt a similar standpoint and include deliria in the acute variety of "organic-reaction types," usually ascribable to a temporary toxic process affecting the brain substance, as opposed to the chronic organic-reaction types, in which there is a more severe tissue change and usually a progressive degeneration. So far as I am aware, these authors do not specifically state the meaning which they ascribe to the term "organic," but they would appear to apply it to conditions in which either an actual alteration of brain substance or the presence of a toxic or metabolic agent acting on the brain substance is known or inferred to exist. Régis and Hesnard[4] uncompromisingly assert that mental confusion is the "*psychose-type*" of the exo- and auto-intoxications "*partout et toujours la même sous ses diversités symptomatiques.*"

A Problem in Three Parts

Consideration of the views expressed by these various authors indicates that the problem with which we are here concerned falls into three parts. Is there an "organic-reaction" which can be discerned and differentiated in whatever setting it may appear? Is there within this "organic-reaction" a "delirium" syndrome which can be sharply marked off? And thirdly, if this second question is answered in the negative, are there at least in delirious states features tending to occur together with a constancy which enables inferences to be drawn concerning their nature and causation?

It is generally agreed that to the first question an affirmative answer can be given, though only within certain limits. The organic-reaction is usually described as manifesting itself in processes of two kinds, which may be combined in various ways. On the one hand there are deprivation phenomena due to loss of function or loss of control, such as appear characteristically in the organic dementias. On the other hand there are confusional states, often hallucinatory, such as are exemplified in the deliria. Clinical experience amply confirms this formulation so far as a large range of cases is concerned, and typical instances presenting the features described can be immediately recognized and differentiated without difficulty. It has been seen, however, that as we move away from these typical instances we find a graded series of cases which ultimately takes us to schizophrenic and other pictures with but little obvious relationship to characteristic organic conditions. We cannot therefore say that an "organic-reaction" can be discerned and differentiated in whatever setting it may appear, but only within a certain range of cases where the features composing it are pronounced. If those constituent features, loss of function, loss of control, and confusion, could be sufficiently precisely defined, it might be possible to observe and differentiate them throughout the whole series of graded cases to which

reference has been made, and inferences of great value might then become possible. Unfortunately none of these features as yet permit of such precise definition, and therefore the step forward cannot at present be made with any certainty.

To the second question, whether within this "organic-reaction" a syndrome "delirium" can be exactly marked off, the answer must obviously be negative. It is clear that here also, while typical deliria form easily recognizable pictures, they shade off by imperceptible steps to pictures of an entirely different kind.

In attempting to answer the third question, whether in delirious states specific features occur together with a constancy permitting inferences to be drawn concerning nature and causation, we are met with the difficulty already mentioned with regard to "organic-reaction" in general, the difficulty of precisely defining those specific features. We may accept Curran's statement that restlessness and confusion are universally present, but the former obviously admits of no clear-cut definition, and it is very questionable whether this is not equally true of the latter. Curran's equation of "confusion" with "difficulty in grasp and clouding of consciousness" certainly describes a phenomenon familiar and recognizable in its typical forms, but not one with exactly definable properties and limits. Régis and Hesnard's claim that confusion is a specific character of toxic states, constituting a picture everywhere and always the same in diverse settings, is surely unduly optimistic.

In these replies we are really recording a difficulty which constantly besets progress in psychiatry. Manic-depressive psychosis, schizophrenia, and paranoia are clinical entities which in their typical ranges present characteristic and immediately recognizable pictures, but they shade off into one another and into other psychoses. The concept of reaction-types in place of the older concept of disease-entities gives us a better understanding of these transitions, but it will not take us very far unless we are able to describe and differentiate those reaction-types in precisely definable terms. Until that time arrives, diagnosis and prognosis must necessarily depend upon clinical experience and intuition rather than on deduction from established principles. The deliria, however, do provide a group of cases from the study of which there is a good prospect of opening up an avenue leading in the desired direction, because we already know at any rate some of the causal factors responsible for the deliria. If the phenomena ascribed to those causal factors can be precisely formulated, and a specific connexion established between cause and effect, so that this specific connexion can be traced out throughout the graded series of allied states, we should be able to penetrate far into the general problem of the aetiology of psychoses.

Causation of Deliria

If we confine our attention to typical deliria it can confidently be stated that in the great majority of cases a "toxic" origin can be demonstrated or reasonably inferred. This is at once evident in the deliria arising from the abuse of various drugs, and in delirium tremens, though in all these cases we do not know whether the causal agent is the drug itself or some substance of the nature of an antibody generated by the organism. It is also a reasonable inference that the deliria of acute specific diseases result from a "toxin" produced by the primary disease, although again we have no knowledge of its precise nature or mode of manufacture. Further it is a plausible assumption that the deliria occurring in senile psychoses, general paralysis, and cerebral traumatism may be mediated by toxic processes, though here the modification of brain substance directly responsible for the delirium may be produced not by a circulating toxin but by the immediate action of the disease processes or the trauma.

If we next turn to those conditions standing nearest along the scale of allied states, the cases included in the group termed "acute confusional insanity," we find them associated with preceding factors of two kinds. In the first place there may be factors of an obvious exo- or endogenous toxic type, such as externally introduced poisons, or puerperal conditions. In the second place there may be factors such as states of excessive fatigue or emotional stress, and in both it is a reasonable inference that the delirium is due to chemical substances generated in association with those states.

Finally, it would be a plausible assumption that, where definite episodic deliria occur in the course of other psychoses, such as schizophrenia, their causation is also to be ascribed to a transitory toxic process, and this might apply also to hysterical deliria. But the assumption becomes more and more strained when we remember that the deliria of schizophrenia shade imperceptibly into schizophrenic symptom-complexes of a very different kind, and that hysterical deliria shade into somnambulisms and other phenomena occurring in settings in which a toxic origin seems remotely improbable.

In this connexion it is necessary to realize that, although in certain typical deliria a toxic agent undoubtedly plays a causal part, we have no knowledge as to its precise mode of action or the links by which it leads to that final modification of brain substance which may be presumed to be the immediate cause of delirium. There is no reason why this final modification should not be equally producible by agents of a quite different nature. For example, the connexion between delirium and toxic processes may be no more specific than that existing between hemiplegia and any one of the causal agents primarily responsible for it such as cerebral haemorrhage, thrombosis, or trauma, all of which are very different from one another but similar in their capacity for producing the destruction of brain substance which immediately results in hemiplegia.

Our knowledge of the causation of deliria is indeed limited to the statement that in a majority of cases deliria are preceded by factors bearing a general resemblance to one another and therefore included under the somewhat indefinite term "toxic." Of the precise processes by which delirium is mediated we know nothing. In discussing at the present time the possible pathogenesis of delirium we have therefore to leave the sphere of knowledge and enter that of hypothesis and speculation.

Theories of Pathogenesis

In considering the character and genesis of the modification of brain substance presumed to be responsible for delirium an important place must be given to the theories put forward by Hughlings Jackson. The application of these theories to the special problem of delirium has been reiterated and amplified in a recent paper by Levin.[3]

Jackson's views with regard to the structure and mode of functioning of the nervous system are too well known to need description here. The essential points bearing upon our present purpose are as follows. The nervous system is a sensorimotor mechanism composed of a hierarchy of "centres" or "layers," the higher and more recently evolved centres being not only more complex and specialized, but also serving to control or inhibit the activities of the lower centres which, being older in the scale of evolution, are more firmly organized and automatic. A centre can be affected by lesions of two kinds: "destroying" lesions, whereby the functioning of the centre is diminished or abrogated; and "discharging" lesions, whereby the function of the centre is stimulated. If a higher centre is the seat of a "destroying" lesion then

the lower centres which should normally be under its control are freed from that control and proceed to manifest activities in accordance with the lower evolutionary level corresponding to those lower centres.

In his Croonian lectures Jackson[7] applies these principles to delirium. He holds that in this condition there is on the one hand a loss of function in the highest centres, due to a "destroying" lesion, which produces only negative manifestations, such as disorientation and other incapacities. On the other hand there is uncontrolled activity of the *healthy* lower centres, which produces the positive manifestations of delirium, such as restless activity and mistakes in identification. Levin in his paper endeavours to explain the occurrence of hallucinations in delirium along precisely the same lines.

It is to be noted that Jackson's theory is consistent with and helps to explain many of the facts of observation mentioned above. The clinical relationship of delirium to coma becomes immediately intelligible if coma is ascribed to a more or less complete inhibition of function by a "destroying lesion" of highest centres, and delirium to a similar but more incomplete inhibition. The gradation of states from typical deliria to obviously allied but not identical pictures is easy to understand if the essential factor is simply the inhibition of a higher centre manifesting itself by purely negative features, and therefore allowing a great diversity of positive symptoms, because those symptoms are conditioned by factors completely independent of the primary lesion. Further, although toxins of various kinds may all be capable of producing a "destroying lesion" of higher centres, there would be no reason to suppose that a delirium produced by one toxin would differ essentially from that produced by another, because the manifestations of a paralysis of function would be the same whatever the cause responsible for it. This is in accord with the clinical observations of many authors who have failed to find specific peculiarities in the delirium resulting from various toxic processes. Finally, the theory would support the view that an organic-reaction type can be distinguished, characterized by confusion or other features, so long as those features can be shown to be negative in character and hence ascribable to a loss of function.

Further, the view that the onset of a delirium is partly dependent upon a constitutional factor, as shown by the observations of Curtius and Wallenberg[8] in cases of pneumonia, and by the greater liability of children to develop delirium in febrile illnesses, would fall into line here. Whatever the constitutional factor may consist in, it can easily be regarded as something affecting the tendency of the "higher centre" to break down under stress. Moreover, if it could be established that individuals developing psychoses of any kind in later life had in previous febrile illnesses manifested delirium in a proportion significantly higher than the average, this would support an interesting extension of Jackson's theories to the genesis of psychoses in general.

The chief limitation of Jackson's theory is that, while it provides a satisfactory explanation of the *existence* of a delirium, it contributes but little to the understanding of its *content*. The positive phenomena comprising the latter are ascribed to the uncontrolled activity of lower centres, manifesting themselves in accordance with the evolutionary level which they have attained, and Jackson strives to show that such a symptom as a patient mistaking his nurse for his wife can be interpreted as the activation of a well-organized mechanism existing before the development of refinements in discrimination possible with the evolution of higher levels. This is not very satisfying, however, and it is easier to accept the more general statement of Wolff and Curran[4], that the content and individual characters of a delirium are dependent upon the individual equipment and experience of the subject, a conclusion based upon a careful investigation of a series of cases in which the influence of these latter factors is very clearly shown. It is to be observed that, in the present state of our knowledge, such factors can be formulated more illuminatingly in psychological rather than in neurological terms, and hence that psychogenic conceptions must be taken into account in endeavouring to explain the content of a delirium. The obvious relationship of delirium and normal dreaming would find its explanation here.

A problem which presents itself here is how far the content of a delirium is entirely to be ascribed to such factors as "individual equipment and experience," whether those factors be described in neurological or psychological terms, or how far it may in certain cases be partly due to direct stimulation of "lower centres" by a "toxin." That is to say, whether Jackson's assumption that the positive phenomena of delirium arise from the uncontrolled activity of healthy lower centres is wholly correct, or whether those lower centres may not also be the seat of a "discharging lesion." So far as I am aware, only a purely speculative answer can be returned to this question.

Relation of "Psychogenic" and "Organic" in Delirium

In view of the fact that in delirium the clinical picture is obviously determined by processes in part "organic" and in part "psychogenic," it provides an exceptionally favourable field for the examination of the relation between those terms and between the processes which they denote, and I propose to conclude my paper with a brief consideration of this question. It is necessary first to clarify the situation by defining the sense in which the terms "psychogenic" and "organic" are to be used, because a great deal of confusion of thought has resulted from the ambiguities and radical diversities of meaning with which both those terms, as also the word "functional," are employed by different writers.

"Functional" sometimes indicates a disordered condition for which no structural basis has yet been discovered, while sometimes it is equivalent to "psychogenic." In the former sense it refers rather to a stage of knowledge than to an essential character of the condition itself; in the latter it would seem to be superfluous. "Psychogenic" is sometimes employed to denote disorders arising as a sequel to emotional stress or shock, but as the connexion between the emotional state and the disorder is usually conceived in purely chemical or physiological terms this use would seem to be undesirable and misleading. As most commonly applied it indicates a disorder in which the causal factors are considered to be "mental" as opposed to disorders in which the causal factors are considered to be "neurological" or at any rate "physical." The implication is that in the former group "neurological" or "physical" causal factors do not exist, an implication against which the neurologist must emphatically protest, as he necessarily holds the faith that all behaviour processes, whether normal or abnormal, will ultimately be explicable in terms of the nervous system. "Organic" sometimes may mean simply "non-psychogenic," or it may be applied to a disorder in which alteration of brain substance, or a toxic agent causing a modification of brain substance, is known or inferred to exist.

I would suggest that the term "psychogenic" is best used to connote a *mode of explanation*, in which the causal processes responsible for a particular sequence of phenomena are conceived in psychological terms and by the aid of psychological concepts. It does not imply that those causal processes are incapable of being conceived in neurological terms, and certainly not that they are essentially and for ever incapable of being so conceived, although in practice it does generally imply that in the present state of knowledge the psychological mode of con-

ception is more helpful in understanding and controlling the phenomena in question.

The most useful distinction between the connotation of "functional" and "organic," as applied to disordered processes, would seem to be that in the former the causal factors act through the ordinary channels by which those processes are normally activated, whereas in the latter the causal factors do not act through those channels. For example, a hysterical hemiplegia is termed functional because the absence of movement in the paralysed side is produced by the ordinary machinery whereby one side of the body is normally kept still, whereas in an organic hemiplegia the absence of movement is due to an external factor which does not act through the ordinary channels, but is as it were impinged upon the machinery from the outside. The hysterical hemiplegia is further called "psychogenic," because we can conceive the causal processes, which ultimately utilize the ordinary machinery to express themselves, in psychological terms more profitably than in neurological terms. In the future these processes may prove capable of being represented in terms of the activity of the central nervous system, and with this advance in knowledge it may be found that the psychogenic mode of explanation may profitably be discontinued.

If we apply this terminology and these principles to the problem of delirium, it is clear that in the great majority of cases the *primary* causal factors are "organic," and consist in a modification of brain substance produced either by a toxin or a degenerative process, and not by stimuli acting along the channels whereby that area of brain substance is normally activated or inhibited. It is conceivable, of course, that the neurological substrata underlying processes at present best represented in psychological terms may be capable under certain circumstances of producing a similar modification of brain substance, and such a process may explain some instances of hysterical delirium. Only in this sense, however, can we speak of a delirium being *primarily* psychogenic.

If this primary organic process has occurred, the particular features which the delirium displays may be conditioned by factors in which the primary process is not concerned. If we accept Hughlings Jackson's view that these features are due to the uncontrolled activity of healthy lower centres, then this activity will presumably be explicable in the future in terms of neural mechanisms not affected by the primary process. It would therefore not be "organic" in the sense defined above, except in so far as there may be modifications of brain substance due to "constitutional" or "congenital" conditions affecting the functioning of the mechanisms in question. At present it is probable that this "lower centre" activity of Jackson may be best understood in terms of psychological processes and concepts, and hence be properly treated as "psychogenic." In this way we can understand the frequent statement that while the form of a delirium is organically determined its content is largely influenced by psychogenic factors, and the conclusion reached by Wolff and Curran, and other investigators, that the content of a delirium is dependent in large part on the individual equipment and experience of the subject. If, on the other hand, it is considered probable that the lower centres are directly influenced by circulating toxins and therefore not "healthy," then their activity would be partly ascribable to an "organic" process, and not entirely to "functional" processes.

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PULMONARY TUBERCULOSIS AND PREGNANCY*

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Of all the facts in regard to the influence of pregnancy on pulmonary tuberculosis with which the obstetrician is brought face to face, the most significant is the devastating influence of labour and the puerperium on the course of the disease. This is well brought out in a survey of the history of forty-six cases which I have carried out for the purpose of this communication. In this group there was a total of fourteen deaths, or 30.4 per cent. If we restrict the study to those cases whose follow-up has extended to one year or more and to those who have died within this period we are left with thirty-six patients, of whom fourteen died, giving a death rate of 38.8 per cent. Of this total eight, or 57.1 per cent., died during the interval from a few days up to three and a half months immediately after the confinement; twelve, or 85.7 per cent., died within two years of the confinement.

The damaging influence of pregnancy and labour is revealed in another way. Out of the eight cases in which death occurred within three and a half months after labour it was found that the pulmonary disease had, in seven cases, existed for periods varying from one to ten years. This demonstrates very clearly the manner in which pregnancy and labour bring to bear upon a chronic disease an acute, critical, and often lethal influence. The same lesson is brought out by the evidence which has been furnished by many observers to the effect that a latent lesion may first reveal itself subsequent to the birth of a child. There are two such cases in my series, in which the onset of the disease became first apparent soon after a birth previous to that for which she was subsequently under treatment. It is obvious that this aspect of the subject is more likely to come within the ken of the physician and the tuberculosis officer than the obstetrician.

Effects on Temperature

The way in which labour and the puerperium so often cause a flare-up in the disease is demonstrated dramatically by a study of the temperature charts of a series of cases. We can in this way recognize how frequently, even in those cases where activity is not in doubt, there occurs a rapid deterioration in the local and general condition. In twenty-seven cases, or 58.6 per cent. of the forty-six cases which have been the subject of this investigation, there was an appreciable depreciation in the clinical condition in the puerperium. In eight, or 17.4 per cent., death occurred within three and a half months.

In view of this evidence, which we may regard as a commonplace in the experience of those obstetricians who have observed a considerable number of such cases, it may seem somewhat surprising that there are still some few

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obstetricians and physicians who deny its relevance, and who maintain that the fate of the phthisical woman is not materially prejudiced by the fact of child-bearing. It is true that pregnancy itself in many instances seems to exert a favourable influence on active disease, and from this no doubt has arisen the opinion widely entertained by the laity that women suffering from pulmonary tuberculosis stand to profit by child-bearing. It also, to some extent, explains the attitude of those medical men who maintain that, despite the well-recognized risk associated with labour and the puerperium, the general effect is beneficial or, at the worst, merely negative, and who do not regard active pulmonary disease as necessarily a deterrent to marriage and child-bearing.

Experience of Other Workers

I believe these views to be unsound and dangerous, and to have been responsible for much of the tragic circumstance that surrounds this subject. The attention which has been devoted to the question during recent years has provided increasing evidence of their fallacy. Robinson addressed a questionary to 200 specialists throughout the world and, from their replies, concluded that " the chances appear to be nearly five to one against the effects of pregnancy being harmless to a tuberculous woman." Rist, in a paper opening a discussion on this subject at the Edinburgh Meeting of the British Medical Association in 1927, adduced striking evidence along the same lines. Of fifty-two women suffering from tuberculosis who became pregnant, the disease was aggravated in forty-four, or 84.6 per cent.; and nineteen, or 36.5 per cent., died within one year; of these nine died during pregnancy or within three months of labour. Further, of fifty-five women who first developed the symptoms during the course of the pregnancy, twenty-two, or 40 per cent., were dead within one year.

It is not clearly understood why during pregnancy the clinical features of pulmonary tuberculosis are so apt to abate, nor why, after labour, they are so apt to increase in their intensity. It has been claimed that the suspension of the blood loss of menstruation and the safeguarding of the calcium reserves which this implies may be a factor of some importance in explaining the relief during pregnancy. It has also been suggested that the increased rest and attention to general hygiene enjoined by pregnancy may play a part. Many specialists, however, believe that the most important influence is the upward rising of the uterus and the splinting of the diaphragm with a consequent restriction of the lung movement, especially during the later months. Conversely, it is maintained that the sudden release of this upward thrust after labour, and the recovery of the freedom of lung movement with, in addition, the straining incidental to delivery, leads to a dissemination of the disease, and to the aggravation which reveals itself during the puerperium.

Puerperal Crisis

However we may explain it we have to recognize, as I have stated at the beginning of this paper, that the puerperal crisis is the most sinister feature of the problem. The influence it exerts in initiating the local deterioration that the majority of our cases suffer at this time and which in a high proportion progresses to a rapid issue must be regarded as pointing to the main responsibility inherent in the management of pulmonary tuberculosis complicating pregnancy. All other considerations are of secondary importance when compared with the necessity of safeguarding the patient as far as is possible against this, the major, risk. We do not minimize the urgency of this consideration by the statement that it is not all cases, even among those with active disease, who exhibit this puerperal exacerbation; it is true that a certain proportion pass through labour and the puerperium with their disease little influenced. Nevertheless, the fact that must dominate any attempt to estimate the risk is that the majority of active cases are adversely affected, and that quiescent and even latent lesions may be stirred into activity.

Sanatoria and Maternity Hospitals

When we pass to the consideration of the best ways of protecting the tuberculous woman against the damaging influence of child-bearing we are faced with difficulties that are both grave and varied. Many of these difficulties are of such a kind as can more adequately be dealt with by the tuberculosis specialist. They relate to matters that more especially concern the medical expert and on which the obstetrician cannot presume to speak with authority in so far as it rarely falls to his lot to see such patients except as infrequent incidents in his routine practice. In this connexion it cannot be denied that in many respects the management of the phthisical woman who has the misfortune to become pregnant is often apt to suffer from the dual medical control that obtains under existing conditions. Thus, the practice of transferring a woman with active tuberculosis from a sanatorium where she has been treated during her pregnancy to a maternity hospital for the purpose of her confinement is apt to lead to a breach in that unity of supervision which is so important in all obstetric cases, and which is especially necessary in tuberculous women. In the first place, in few maternity hospitals can the women find the suitability of environment which is possessed by the sanatorium and which is doubly necessary during a period of such extra danger. For the isolation which is demanded by such cases the segregation department of an ordinary maternity hospital is not only unsuitable, but may be dangerous. Further, the specialist nursing and the constant specialist medical care and treatment can rarely be reproduced within the walls of a maternity institution.

It is difficult to evade the conclusion that some of the tragedy that surrounds child-bearing in the tuberculous woman is to be traced to the inadequacy of the control to which we have referred. Further, it may be urged that much of the divergence of view and of the uncertainty that relates to the best means of managing such cases arises from the fact that this lack of unified control has undermined efforts directed to a proper study of the problem in its many and varied aspects. It may be urged with reason that the difficulties to which I have alluded could best be eliminated by recognizing that the delivery of such women should become a function of the sanatorium in which they are being treated for their medical condition. The powers possessed by the local authority in regard to both tuberculosis and maternity would seem to provide the means by which this desirable arrangement can be achieved. The preventive aspects of our subject can be considered under several headings.

Advice as to Marriage and Child-bearing

The woman with active disease should be dissuaded from marrying and, if married, from bearing children. The period which must elapse after the arrest of active disease before marriage or child-bearing is allowed is a matter for consideration in each special case. The physician will in general demand three years' freedom from all symptoms and satisfactory *x*-ray and other physical evidence of healing. In some instances where the prevention of child-bearing is of urgent importance operative sterilization or sterilization by radiation methods may be employed. In other cases the patient and the husband should be instructed in birth control methods.

Abortion

The place of therapeutic abortion in the treatment of the tuberculous woman is difficult to define. It is the method of choice where the clinical condition is at the moment satisfactory but the state of the lungs is such as to justify a reasonable anticipation of danger after a full-time delivery. The procedure is thus fully justified in the case of an undesirable pregnancy in a woman who has recently passed through a gestation ending in a turbulent puerperium. There can be little doubt that in the less severe grades of the disease termination of pregnancy in the early months is an obstetrical procedure associated with less risk than delivery at the later months. It is now generally agreed that to give the maximum of protection the abortion should be performed within the first three months, and that the earlier in pregnancy the interference is carried out the better. Some observers maintain that after the third month the operation is futile, and that in all cases seen after that date it is safer to allow the pregnancy to continue. It is difficult on obstetrical grounds to justify this extreme view and more supporting data than are at present available are required before it can meet with complete acceptance. In the present state of our knowledge there is no adequate reason for doubting that abortion at, say, the fourth or even the fifth month may in suitably selected cases give an increased protection.

The technique adopted is within certain recognized limits of as great importance as the selection of the time for its performance. It has to be noted that the emptying of the uterus during the early months, unless carried out with care and skill, may seriously imperil the patient's chances. The choice of the anaesthetic is important and, in this connexion, it is imperative to avoid inhalant drugs that tend to pulmonary irritation, such as ether. In the selection of the anaesthetic regard must also be had to the risks of post-operative nausea and sickness. In the next place, the operation should be carried out with as little risk of shock and blood-loss as possible. Further, it is important to safeguard the patient as far as is attainable against pelvic sepsis, which is especially prone to prejudice the outlook of the tuberculous subject. Evacuation of the uterus by abdominal hysterotomy is a quick and safe procedure and, when carried out under spinal anaesthesia, it is relatively bloodless. It is, also, associated with less risk of sepsis than evacuation through the vaginal route. It has the further advantage that sterilization can be effected at the same time. Where evacuation by the lower route is decided upon the two-session method should be adopted. At the first session it is my practice to introduce two or three laminaria tents after cervical dilatation and, twenty-four hours later, to carry out the evacuation. Avertin given rectally as a basal anaesthetic in a dosage of 0.1 gram per kilo of body weight, reinforced, if necessary, by a carefully administered gas-oxygen mixture, is safe and suitable.

Management of Later Months

For those cases unsuited because of the severity of the pulmonary lesions for therapeutic abortion in the early months, and for all cases first seen in the latter months of pregnancy, the gestation should be allowed to continue. The treatment is directed to the building up of the patient's health and to the employment of those local measures, such as artificial pneumothorax in unilateral lesions, which are calculated to help the pulmonary condition. It is further of the utmost importance that for the delivery and the puerperium the environment should be selected with a view to its suitability for the management of such cases. During the delivery the patient should be protected against the risks of haemorrhage, shock, and sepsis. Here, again, the anaesthetic should be carefully selected. We have previously referred to the dangers inherent in a system which tends to divorce the care of the patient during the obstetrical period from that during the ante-natal phase.

The phthisical woman is unfitted for nursing. The damaging effects of lactation on the pulmonary lesions are notorious. Further, the risk of the transmission of the disease to the infant is considerable. The interests of the child are best served if it can be completely removed from the home until the active phase in the mother has been arrested.

I wish to acknowledge my great indebtedness to Dr. H. Nockolds, Medical Superintendent of Lewisham Hospital, for placing at my disposal the records of 44 cases, and to Dr. A. Middleton Hewat, Senior Medical Officer to the London County Council, for providing me with the notes on the subsequent progress of the cases studied.

PULMONARY TUBERCULOSIS AND PREGNANCY*

BY

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I approach the problem of tuberculosis and pregnancy as a general physician, expert in neither of the special subjects professed by the Sections which have combined in this meeting. I decline on this account, however, to offer an apology to those who would question your choice in asking me to open this discussion and condemn my judgement in accepting your invitation. The conductor of an orchestra aims at interpreting a musical composition according to his conception of it as a whole; his job is to integrate into a harmonic unity the work of the individual instrumentalists under his baton. He cannot play the violin as well as his leading violinist; indeed his performance on any instrument may be worse than that of the meanest member of his orchestra. But the finished performance is *his* conception, and he alone must decide what contribution to this end shall be made by the separate members of his orchestra.

Now the general physician is like unto the conductor of an orchestra. He views the problem which a patient presents as a whole; he recognizes, and should hasten to take advantage of, the more detailed knowledge and particularly the greater technical skill of his specialist colleagues, be they surgeons, obstetricians, aurists, orthopaedists, and the like. But he must remain the overseer, the integrator of the many phases of the problem presented by his patient, and he will, also, remain the judge in his wider and deeper wisdom of how far general conclusions to which his specialist colleagues have come are applicable to the individual patient under his care.

This discussion limits itself to pulmonary tuberculosis, but considers its effects on all phases of child-bearing. I shall omit the consideration of historical *obiter dicta* on this subject which have been forthcoming since the time of Hippocrates, for though they are of consuming interest and fascination to the historian of medicine, their slender foundation and their mutual contradiction deny them a place in a scientific discussion.

What are the questions to which it is desirable that accurate answers based on unimpeachable statistics should be forthcoming? Clearly the most significant is, "Does child-bearing lessen the mother's resistance to the tuberculous infection?" This might be considered under three subheadings: (1) Does child-bearing activate (*a*) a latent,

* Read in opening a discussion at a joint meeting of the Sections of Tuberculosis and Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Oxford, 1936.

or (*b*) an arrested (quiescent) lesion, and if so, in what degree? (2) Does child-bearing accelerate the rate of progress in active pulmonary tuberculosis and precipitate a fatal issue? (3) Is child-bearing beneficial to the mother suffering from pulmonary tuberculosis? This last question arises only if our answers to those which precede it are in the negative.

The Terms "Latent" and "Arrested"

Before we attempt to answer these questions we must not shirk, as so many authors have done, the difficulty of defining our terms, for this omission has led in the past to much confusion of thought and statement. "Latent tuberculosis" is an unfortunate phrase with implications almost as numerous and variable as the authors who use it. Did not Osler believe that 90 per cent. of mankind had "latent tuberculosis"? I regard the term as one essentially clinical. It is of practical value in considering the management of a patient, but, in my view, valueless for statistical analysis. A patient who is losing weight, who is suffering from a slight cough, and who gives a past history of pleurisy and a bad family history of tuberculosis is justifiably regarded from a practical standpoint, even if bacteriological and radiological evidence be negative, as a tuberculous patient if adequate investigation fails to reveal any other cause for the symptoms. This is the purely negative method of diagnosis by elimination, but if the patient is suffering from pulmonary tuberculosis we have adopted the treatment adequate to the condition; if we fail to treat these suspicious symptoms as tuberculous in origin we may lose the opportunity for cure. But clearly the loopholes in this method of diagnosis are numerous, and any statistics based on such variable and unstable criteria must be disregarded.

Leyland Robinson, acknowledging this difficulty, seeks to define four clinical types of latent tuberculosis:

1. A patient with a simple but suspicious catarrh, a family history of tuberculosis, and a negative sputum, who becomes sputum-positive during pregnancy.
2. A weakly but apparently healthy woman who for no adequate reason, such as special exposure to infection, develops tuberculosis during pregnancy or the puerperium.
3. A patient who develops tuberculous lesions during or after successive pregnancies and remains free from active disease in the interval between each reproductive epoch.
4. Those individuals who, coming from families with a special tendency towards tuberculosis, possess a lowered resistance to this infection and are therefore specially prone to develop the disease under conditions of stress.

To this author, in the limits defined, the first appearance of active tuberculosis during pregnancy indicates a previously latent lesion.

Arrested (quiescent) lesions are those which once presented positive evidence—radiological, bacteriological, and constitutional—of active disease but are now free from all evidence of activity.

If we are to answer accurately the questions we have posed, adequate information must be forthcoming on the following specific points: (1) Does pulmonary tuberculosis first appear with greater or less frequency in a group of pregnant women than in an exactly similar group of non-pregnant women? The answer to this question would prove the deleterious or beneficial effect of pregnancy in the so-called "latent" tuberculosis. (2) Do relapses occur with greater or less frequency in arrested or quiescent cases if the patient becomes pregnant? (3) Does a pregnant woman with active tuberculosis improve or more rapidly decline than a non-pregnant victim of the same age, social circumstances, stage, and type of disease, etc.?

It must be confessed that an exhaustive search of the literature fails lamentably to provide the necessary data from which accurate answers to these three fundamental questions can be given. It is perhaps not surprising, however, that the difficulties which confront us in collecting such data should be almost insurmountable. The relative rarity of the association of pulmonary tuberculosis and pregnancy (probably not greater than 1 to 2 per cent. of the total number of births) leads to the number of cases under the direct supervision of one group of observers being comparatively small. It is therefore necessary to pool results if a sufficiently large number of cases is to be statistically analysed. But this pooling is most unsatisfactory because the variables in the separately published groups of cases are enormous. Not enough consideration is given to the type of infection, the stage of the disease, the stage of the pregnancy, the number of previous pregnancies, the social, economic, and climatic conditions of the patient's life, the past and family histories, and the mental attitude towards pregnancy; to the availability of expert obstetrical service in a sanatorium, or the provision of adequate sanatorium treatment in a maternity hospital; to the cases which are lost sight of in the early months following pregnancy, and so forth. Leyland Robinson has attempted to circumvent this difficulty by seeking the views of 200 experts from all parts of the world on the problems presented, and analysing their replies. But this is statistically a fallacious approach. If individual opinions are based on inadequate data the sum of those opinions is no more trustworthy. And in many cases there can be little doubt from the internal evidence that these observers have followed the precepts of their teachers without subjecting them to the close scrutiny of personal experience. Witness Carnac Rivett who, in discussing the question of suckling the infant, says "I have always been taught 'for the tuberculous mother—no suckling,' and I have always carried this out, so I cannot say whether it is right or wrong"—an honest if ingenuous confession.

Some Statistics from the Literature

If, then, we cannot secure the type of information we desire, are there any available statistics from which conclusions of practical value can with fair certainty be drawn? Let me refer first to an illuminating paper of Bridgeman and Norwood, based on the notes of 14,000 maternity cases in Baltimore, U.S.A., of which 134—that is, less than 1 per cent.—were grouped as pulmonary tuberculosis in various forms. It is of interest to note that this incidence corresponds roughly to the morbidity rate for pulmonary tuberculosis in the whole city of Baltimore, suggesting that there is no gross increase in the incidence of pulmonary tuberculosis during the period of gestation, though here again reference to specific age and sex groups would be necessary before the contention could be held valid. Three of their groups of cases are of special interest:

1. *Pregnancy with Questionable Tuberculosis.*—In this group there were 50 cases and no deaths. Forty-five healthy babies were born (average weight 7.6 lb.), and the subsequent history did not suggest that any of these children developed tuberculosis. There were 4 spontaneous abortions or premature births, and 1 death during delivery. If we compare these figures with 100 consecutive normal deliveries under the same conditions we find that 89 were healthy (average weight 7.3 lb.), there were 4 abortions or premature births, and 7 babies were stillborn or died in the first two weeks of the puerperium. Whatever might have been their criteria for "questionable tuberculosis," it is clear that this dubious lesion had no observable effect on the course of pregnancy; nor did pregnancy affect it.

2. *Pregnancy with "Definite but Inactive" Pulmonary Tuberculosis.*—In this group there were 17 cases—10 unilateral and 7 bilateral. Ten of these patients had follow-up notes for six to twelve years and were well; the remaining 7 were in excellent condition six months to five years after the delivery. All were in poor financial circumstances and 15 of the 17 had normal full-term babies. From these figures one can justly conclude that healed tuberculosis is unaffected by pregnancy, even in the adverse social circumstances of these patients.

3. *Pregnancy Associated with Active Pulmonary Tuberculosis.*—In this group there were 31 patients. A year after delivery 10 were dead, 8 were unimproved, and 2 were improved. The remaining 11 had histories of too short duration from which to draw definite conclusions, but I have attempted from the abstracts which are given of all the cases in this paper to detail these 11 cases, and I find that they are as follows:—

Case 1.—Eight months later general condition fair but definite activity. Working regularly.

Case 2.—Discharged in good condition.

Case 3.—Discharged in poor condition two months after delivery.

Case 4.—Discharged in poor condition.

Case 5.—Discharged in good condition one month after delivery.

Case 6.—Discharged in worse condition three weeks after delivery.

Case 7.—Discharged in fair condition (but said to have tuberculous ulceration of the larynx!) two weeks after delivery.

Case 8.—Discharged in very poor condition three months after delivery.

Case 9.—Discharged in poor condition three weeks after delivery.

Case 10—Discharged in fair condition three weeks after delivery.

Case 11.—Discharged in very poor condition six weeks after delivery.

I think it fair to assume that 6 to 8 of these patients would certainly have been dead within the year. Thus we might say that out of the 31, 16 at least (50 per cent.) would have died within a year of delivery. But is this mortality figure greater than that found in non-pregnant actively tuberculous women in a similar age series of approximately the same stage of the disease? The authors quote 72 cases of non-pregnant actively tuberculous women of whom at the end of a year 23 (32 per cent.) were dead, 24 (33 per cent.) had not improved, and 25 (35 per cent.) were improved. These figures suggest strongly that pregnancy diminished the chances of recovery for the actively tuberculous patient.

It is of interest to compare these statistics with those of Forssner, who found that at the end of a year 37 per cent. of 396 non-pregnant women with an advanced tuberculosis were dead as compared with 46 per cent. of 203 pregnant women. And in Rist's earlier series of 117 cases in which tuberculosis began either during pregnancy or shortly afterwards, 60 of the women (51.2 per cent.) were dead after a period of two years.

Importance of Type and Extent of the Disease

That the type of disease is of paramount importance is suggested by Ornstein and Kovnat. They classify pulmonary tuberculosis into: (1) exudative of (*a*) resolving or (*b*) non-resolving (caseous-pneumonic type); and (2) productive or bronchopneumonic type. The exact definitions of these terms need not detain us, but it is significant that in 85 cases which they collected from their records over a period of ten years there were 31 deaths, and all these were in the 51 cases comprising the caseous-pneumonic group. Out of 51 non-pregnant females suffering from a similar type of lung lesion, 23 were dead after the same period of observation.

The available statistical evidence suggests that in active pulmonary tuberculosis pregnancy aggravates the disease and accelerates its fatal termination. There is no direct evidence that in the so-called arrested or healed cases pregnancy exerts a deleterious effect, though on general principles this might have been anticipated.

We know that pregnancy makes excessive demands on certain phases of metabolism. The call for calcium, iron, and iodine is increased; the basal metabolic rate is raised; renal adequacy declines especially in the later weeks; there is some encroachment on the cardiac reserve; and the respiratory rate is increased. These additional burdens must play their part in determining the rate of progress of a tuberculous lesion, but the evidence suggests that these factors are less important than the type and extent of the disease and the treatment which is available for the patient. The strain of labour with compression and decompression of the lung doubtless interferes with healing of the affected lung tissue, and in the puerperium not only the strain of lactation but the anxieties associated with the management of the child may play an important part.

There is a recurring suggestion in the literature that pregnancy exerts in some specific way a lowering effect on the resistance of the patient to the tuberculous infection—an observation which seems to be based essentially on the work of Nobécurt and Paraf, who stated, according to Rist, that a comparatively high proportion of pregnant women lose their capacity to give a positive skin reaction to tuberculin and recover it only some time after confinement. The mechanical effects on the lung of the enlarging uterus, though the source of much armchair speculation, have not been adequately studied. We can, then, accept the ill-effects of pregnancy in active pulmonary tuberculosis without attempting to define in greater detail the influence of the different phases of child-bearing. On general grounds it would probably be agreed that the effects of labour and the strain of the puerperium are likely to prove most severe.

Contraception and sterilization must clearly be considered and here, as in dealing with the problem of abortion, we should purge our minds of all religious, moral, and political objections and concentrate on the medical aspects of the problem. Coitus is not free from the risks of conjugal infection, and it may be that instruction in contraceptive measures will, by removing the risk of pregnancy, increase the risk of conjugal infection. Sterilization involves operative procedures which add to the patient's burden even if performed under spinal anaesthesia. But these are problems requiring special consideration for the individual.

Treatment: The Lung First

The essential problem to be considered is the treatment for a patient suffering from active pulmonary tuberculosis who has become pregnant. There are clearly two important aspects of this: first, the treatment of the lung condition; and secondly, the possibility of protecting the patient from the ordeal of parturition and the dangers of the puerperium—that is, by inducing early abortion.

It is imperative that the lung condition be treated from the first. The strictest sanatorium principles must be applied, and the question of accessory measures, particularly artificial pneumothorax, must be considered. A recent paper by Rist and Jottras is the most comprehensive on the advantages of artificial pneumothorax. These authors limit their observations to cases which have

been followed for at least two years after confinement, and exclude cases in which collapse therapy was of less than one year's duration. They treated 132 cases. Fifty-eight patients had artificial pneumothorax for proved pulmonary tuberculosis and later became pregnant. Of these 39 began their pregnancy more than a year after artificial pneumothorax treatment had been induced, and of these 39, 26 were cured (20 for three years or longer after confinement and five years or longer after artificial pneumothorax treatment was instituted, and 6 for two years or less after confinement and three years or less after artificial pneumothorax treatment was started). Of the remaining 19 who became pregnant less than a year after artificial pneumothorax treatment was begun, 12 were cured (9 for three years or longer after confinement and four years or longer after artificial pneumothorax treatment commenced, and 3 for two years or less after confinement and three years or less after artificial pneumothorax). The authors emphasize, also, that of the 15 cases which had lost all signs of activity under artificial pneumothorax therapy before conception, 13 remained uninfluenced by pregnancy —that is, 87 per cent.—while of the 43 cases with doubtful or no arrest of the disease only 25 (58 per cent.) terminated favourably—thus re-emphasizing the necessity for curing the pulmonary tuberculosis before pregnancy is permitted.

Of the 74 cases in which artificial pneumothorax was induced for the first time *during* pregnancy (taken between the years 1926 and 1932 so as to give a three-years observation period before reporting results) in only 33 (45 per cent.) were favourable results obtained. Moreover, the earlier in pregnancy the artificial pneumothorax is carried out the more favourable the ultimate result. Of 32 cases treated in the first four months there were favourable results in 17 (53 per cent.). Of 42 cases treated during the last five months of pregnancy there were favourable results in only 16 (38 per cent.). It is also of interest to note that of 38 patients in whom pregnancy supervened on a pre-existing tuberculous lesion, 19 (50 per cent.) were cured, while of 36 in whom the tuberculosis first made its appearance during pregnancy, 14 (39 per cent.) only were cured. It is likely in the latter cases, however, that the more acute type of infection was present. Because of altered conditions of intra-abdominal pressure, there must be careful regulation of the pneumothorax in the later months of pregnancy.

Other surgical procedures such as phrenicotomy and thoracoplasty must be considered in relation to the individual case, the prime consideration being to treat the lung lesion and ignore as far as possible the pregnancy.

Effect of Abortion

Statistics of the effect of abortion are difficult to evaluate, for clearly not only is the stage of pregnancy at which abortion is performed important, but the method and the associated degree of general disturbance it produces is significant. Although abortion was generally urged as a therapeutic procedure in the first two to three months of pregnancy, the available statistics throw considerable doubt on its efficacy in preventing the spread of active disease. In the article quoted by Bridgeman and Norwood statistics are given in which of 9 patients with active tuberculosis who were followed for a year and in whom the therapeutic abortion was performed during the second to third months of pregnancy, 5 were dead at the end of a year. But it is possible that with measures for inducing abortion which involve less active interference—for example, *x* rays—its beneficial effect might be more evident than present statistics suggest. Here again we must await further observations.

The effect of maternal tuberculosis on the offspring is well illustrated by the statistics of Armand-Delille. Of 719 children surviving birth in 175 tuberculous families, 323 were placed in the country away from their mothers, while 396 remained in contact with them. Of the former group all were alleged to have remained well, while of the latter 238 developed tuberculosis. A smaller series is that of Forssner. His figures show that of 34 children removed at birth from tuberculous mothers 82 per cent. were free from the disease after three years and 3 per cent. had died. Of 89 children reared by their mothers 52 per cent. were free from tuberculosis after three years, while 20 per cent. had died. In the first series 3 per cent. of living babies had tuberculosis, and in the second 25 per cent. had the infection after three years. Almost all the available evidence confirms the strong susceptibility to tuberculosis of offspring reared by actively tuberculous mothers.

Summary

In brief, then, this is the general impression left by a critical survey of the available literature. The risks of active pulmonary tuberculosis are increased by pregnancy; this depends to some extent on the type of lesion present. In arrested and healed cases of over two years' duration this risk is by no means prohibitive. As a practical measure, safety lies in treating the lung condition, where the suspicion of tuberculosis arises, with all available therapeutic resources. If pregnancy complicates an active lesion the patient must be treated by experts in the most favourable surroundings. The merits of early abortion still await statistical confirmation.

When we survey the vast literature which has grown round the subject of tuberculosis and pregnancy, and contemplate the paucity of established facts which can be culled therefrom, we are justly humble. Medicine is not yet free from those shackles of authority which led generations of physicians to echo the aphorism of Hippocrates that "pregnancy is the best cure for consumption." In striking contrast is R. A. Young's dictum: "If a virgin, no marriage; if married, no pregnancy; if pregnant, no confinement; for the mother, no suckling"—which admittedly has more evidence to commend it. But advance in our knowledge of the interrelationship of pregnancy and tuberculosis will come not from the *ex cathedra* pronouncements of accepted authority but from the careful collecting of apposite and adequate data and their subsequent unprejudiced analysis.

The directors of the Commonwealth Fund of New York have created a number of Commonwealth Fund Service Fellowships, tenable at American universities, not more than five of which will be offered in 1937 to persons holding appointments over-seas under the British Government, the Government of India, or the Government of a British Dominion, Colony, Protectorate, or Mandated Territory. The actual number of Service Fellows to be appointed in 1937 will be determined by the committee of award. Candidates must be of British descent, single or married, and not have attained the age of 35 on September 1st of the year of award. They must submit a definite scheme of research work or advanced study to be carried out during their residence in the United States, and must produce evidence of their capacity to pursue it with advantage. Fellowships are tenable for a minimum period of fifteen months and a maximum period of twenty-four months, which will run from the date of departure from the country in which the Fellow is engaged in Government service to the date of his arrival on return. Applications, to be submitted on the prescribed form, must reach the secretary, Commonwealth Fund Fellowships, 35, Portman Square, W.1, by February 1st, 1937.

AETIOLOGICAL RELATION OF THE STREPTOCOCCUS HAEMOLYTICUS TO THE "RHEUMATIC" DISEASES

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During the thirty-six years which have elapsed since Poynton and Paine[1] published their important studies on the relationship of streptococci to the " rheumatic " diseases, research workers in all parts of the world have been engaged in investigating this problem. Although a great deal of valuable information has been accumulated it will be generally admitted that the aetiology of the " rheumatic " diseases cannot yet be said to be settled. The efforts made to elucidate their causation have been handicapped by the fact that no universally acceptable classification of these diseases has been found.

Broadly speaking, the " rheumatic " diseases which particularly affect the joints can be divided into three main groups: (1) rheumatic fever, (2) chronic infective arthritis, and (3) osteo-arthritis. The last-named disease will not be considered further, as the lesions found in the joints are the result of degeneration and not of infection. Chronic infective arthritis is the name used to cover a wide variety of chronic arthritic conditions, some of which start acutely, secondary to an obvious septic focus, while others begin insidiously, and the fullest investigation may fail to show any convincing source of infection. The term " chronic infective arthritis " therefore includes the so-called " focal " arthritis and rheumatoid arthritis.

Though the nature of the infective agent in rheumatic fever is at present unsettled no one would deny that rheumatic fever is an infective disease. The use of the term " infective " in the subgroup chronic infective arthritis is, however, open to dispute, and this is particularly true of the cases of rheumatoid arthritis, which start insidiously. We believe that not only is the term " infective " justified, but there is a considerable mass of evidence to support the view that a close aetiological relationship exists between rheumatic fever and chronic infective arthritis. We feel that the differences in the clinical manifestations in these two diseases can be explained by changes in tissue sensitivity at different ages, and by variations in the reaction of the patient to infection, just as well as by the assumption that the clinical changes are the result of different infective agents.

Clinical Manifestations

A study of the various clinical manifestations of rheumatic fever clearly indicates how different tissues are affected at different ages. Thus in infancy and in childhood arthritic changes are slight or absent, and carditis predominates ; in adolescence both heart and joint changes are often present ; while in adult life carditis is rare and the joints are chiefly affected. The influence of the " soil " is recognized in other infections to be of as much importance in determining the type and extent of the clinical changes as is the virulence of the infective agent. In syphilis, for example, one person may develop general paralysis of the insane, a second luetic aortitis, and a third skin eruptions. In tuberculosis, also, no two persons react to infections of the same degree in the same way. Again, in scarlet fever and gonorrhoea less than 10 per cent. of all cases develop arthritis, and it is certainly not the severity of the infection which determines the onset of the arthritis. If it is conceded that in these infections the clinical variations are due mainly to differences in the soil, then it is conceivable that acute and chronic rheumatic conditions, too, may represent different reactions to the same infective agent.

Haemolytic Streptococci in Causation

The wide interest which was aroused last year by the claims regarding the discovery of a virus held to be the cause of rheumatic fever has tended to obscure the great mass of evidence obtained all over the world which incriminates the haemolytic streptococcus as the chief causal agent in rheumatic fever and chronic infective arthritis. The evidence in favour of this hypothesis is based on a study of the intermediate types of arthritis which merge gradually into rheumatic fever on the one hand and into rheumatoid arthritis on the other ; and on the following common factors: (1) familial relationship, (2) geographical distribution, (3) seasonal incidence, (4) initiating factors, (5) pathological similarities, and (6) immunological findings. It is unnecessary to discuss all of these, as they have been fully dealt with in a recent American publication.[2]

The frequency with which an attack of tonsillitis precedes the onset of acute rheumatism has been estimated by various authors at between 40 and 50 per cent. The association of upper respiratory infections with the onset of chronic infective arthritis is, in our experience, of equal frequency ; of eighty cases of chronic infective arthritis seen recently in Aberdeen, thirty-six, or 45 per cent., gave a history of immediately preceding sore throat or upper respiratory infection.

Pathology and Immunology

The occurrence in chronic infective arthritis of subcutaneous nodules indistinguishable histologically from those found in acute rheumatism is a fact which cannot be dismissed lightly. Further, the histological appearances of joint tissues obtained at biopsy from cases of chronic infective arthritis show a striking resemblance to the changes found in acute rheumatism, as has been pointed out by Klinge in Germany and Timbrell Fisher in this country.

Since direct evidence of infection—namely, the cultivation of the specific agent from joint fluid or blood—is generally unsuccessful, reliance must be placed for immunological evidence on indirect measures—namely, serological reactions and sensitivity tests—for the demonstration of a relationship between the different rheumatic diseases and their association with haemolytic streptococcal infections. We investigated on these lines approximately 500 persons suffering from " rheumatic " diseases.

Anhaemolysin Estimations

Table I shows the results of a series of streptococcal anhaemolysin estimations. These were performed by the method of Todd, and the haemolytic streptococcus used both in Aberdeen and in Buxton in the preparation of streptolysin was a scarlet fever strain obtained from Dr. Todd. The exact technique of preparation will not be described here. The term " subacute rheumatism " in this and subsequent tables is used to designate a type of polyarthritis with sudden onset following an upper respiratory infection, simulating or indistinguishable from rheumatic fever, but in which there is little or no pyrexia, and pain and stiffness persist in one or more joints without leaving permanent joint changes.

It will be seen from this table that in the Aberdeen series 100 per cent. of cases of acute rheumatism showed a value of over 50 units, compared with 27 per cent. of

controls of corresponding ages, and 76 per cent. of cases of chronic infective arthritis as compared with 40 per cent. of controls. The proportion having a value of 100 and over is still more striking—92 per cent. of cases of acute rheumatism as compared with 13 per cent. of controls, and 64 per cent. of chronic infective arthritis cases as compared with 8 per cent. of controls. In the Buxton series 88 per cent. of cases of subacute rheumatism and

TABLE I.—*Anhaemolysin Values*

	Disease	No. of Cases	Anhaemolysin Values 0-50	51+	100+	200+	400+	1,000+
Aberdeen Series	Rheumatic fever and chorea	40	0	100%	92%	80%	47.5%	2%
	Controls (corresponding ages)	30	73%	27%	13%	0	0	0
	Chronic infective arthritis	50	24%	76%	64%	30%	4%	2%
	Controls (corresponding ages)	50	60%	40%	8%	2%	0	0
Buxton Series	Subacute rheumatism	151	12%	88%	58%	35%	10%	0
	Chronic infective arthritis	137	33%	67%	35%	18%	0	0
	Controls (osteo-arthritis)	30	80%	20%	3%	0	0	0

67 per cent. of those of chronic infective arthritis showed a value over 50 units, as compared with 20 per cent. of the controls; and values of 100 units and over were found in 58 per cent. of cases of subacute rheumatism, and in 35 per cent. of those of chronic infective arthritis, as compared with 3 per cent. of controls.

From these figures the conclusion is justified that a definitely raised anhaemolysin value is found much oftener in acute and subacute rheumatism and in chronic infective arthritis than in suitable control cases, and the more acute the rheumatic disease the higher the incidence of raised anhaemolysin values.

Streptococcal Agglutinins

TABLE II

Disease	No. of Cases	Titres <1/25	1/25 +	1/50 +	1/100 +	1/200 +	1/400 +	1/800 +
(a) Agglutinins with Streptococcus haemolyticus								
1. Rheumatic fever and chorea	31	100%	100%	94%	80%	51%	27%	6%
2. Chronic infective arthritis	28	100%	100%	96%	89%	75%	50%	7%
3. "Streptococcal" diseases	17	100%	94%	89%	71%	41%	12%	0
4. Controls	20	100%	80%	35%	10%	5%	0	0
(b) Agglutinins with Streptococcus viridans								
1. Rheumatic fever and chorea	31	100%	45%	22%	6%	0	0	0
2. Chronic infective arthritis	28	100%	50%	28%	7%	7%	0	0
3. "Streptococcal" diseases	17	100%	58%	29%	6%	6%	0	0
4. Controls	20	100%	40%	20%	5%	0	0	0

Table II shows the results of agglutination tests carried out in Aberdeen against the *Streptococcus haemolyticus* and the *Streptococcus viridans*. Under the heading of "streptococcal" diseases are a group of cases of uncomplicated sore throat or acute nephritis.

There are considerable technical difficulties in tests with the *Streptococcus haemolyticus*, owing to the tendency to spontaneous agglutination of these organisms. Repeated subculturing to obtain even emulsions may be required; this is a time-consuming operation, hence a limited number of cases were tested by this method. A series of stock strains were used, and the figures given in Table II represent the highest titres at which agglutinins were demonstrable. It will be seen that at a titre of 1 in 100, 80 per cent. of cases of rheumatic fever, 89 per cent. of cases of chronic infective arthritis, and 71 per cent. of "streptococcal" cases gave positive agglutination reactions, as compared with 10 per cent. of controls. Where agglutination tests were carried out with the *Streptococcus viridans* no significant difference was found in any of the groups, agglutinins being demonstrable at a titre of 1 in 100 in only 6 per cent. of patients with rheumatic fever, 7 per cent. of cases of chronic infective arthritis, and 5 per cent. of controls. Similar figures (which are not shown in the table) were found in agglutination tests with the *Streptococcus faecalis*. This table provides further evidence that there is a higher incidence of haemolytic streptococcus infection in rheumatic cases than in normal controls.

Intravenous Sensitivity Tests

TABLE III

Disease	Number of Cases	Organism Injected	Number of Organisms and Reactions 100,000 Focal only	100,000 Focal and General	1,000,000 Focal only	1,000,000 Focal and General	2,000,000 Focal only	2,000,000 Focal and General	5,000,000 Focal only	5,000,000 Focal and General	5,000,000 Number Reactions	10,000,000 Focal only	10,000,000 Focal and General	10,000,000 Number Reactions
Chronic infective arthritis	20	Strep. haem.	—	1	3	5	4	3	1	—	3	—	—	—
Chronic infective arthritis	12	Strep. viridans	—	—	—	—	—	—	2	—	10	—	—	—
Controls	8	Strep. haem.	—	—	—	—	—	—	—	—	—	1	—	7

Table III shows the results of a small series of sensitivity tests. The tests consisted in the intravenous injection of streptococcal vaccines in varying dilution, and in noting the reaction obtained. Reactions have been divided into focal, and focal and general. Of twenty cases of chronic infective arthritis seventeen showed a reaction following on the injection of five million, or less, haemolytic streptococci; in one, a focal and general reaction was observed after the injection of 100,000 organisms. Of twelve cases of chronic infective arthritis two showed a focal reaction after the injection of five million *S. viridans*. Only one out of eight control cases gave a focal reaction following on the injection of ten million haemolytic streptococci.

It would be unwise to draw definite conclusions from such a small series of cases. The results suggest, however, that cases of chronic infective arthritis are more sensitive to haemolytic streptococcal vaccines than are normal control cases, and that cases of chronic infective arthritis are more sensitive to haemolytic streptococcal vaccines than to *viridans* vaccines.

Intradermal Tests

Table IV refers to intradermal tests carried out with extracts prepared from the *Streptococcus haemolyticus* and the *Streptococcus viridans*. The method used was the intradermal injection of dried and ground-up streptococci dissolved in carbol-saline, the test dose being 0.1 c.cm. of a 1 in 100 solution. Injections were made on the anterior aspect of the forearm, and readings were taken twenty-four hours later. A resultant area of thickening and erythema over 10 mm. in diameter was considered positive in the Buxton series, and over 12 mm. in the Aberdeen series. Comparable tests with the two solutions show the Aberdeen solution to be more concentrated, owing to the different methods of standardization employed in the two centres.

It will be noted that the incidence of positive H.S.E. (haemolytic streptococcal extract) skin tests is from two

to three times as high in the Aberdeen series of cases of rheumatic fever, chronic infective arthritis, and streptococcal disease as in the control series. In the Buxton group 34 per cent. of cases of subacute rheumatism and 28 per cent. of chronic infective arthritis cases give positive tests, as compared with negative readings in the control series. Intradermal tests with *Streptococcus viridans* extract show no significant difference between rheumatic

TABLE IV

	Disease	No. of Cases	Total Positive	Total Negative
Intradermal Tests with Haemolytic Streptococcal Extract				
Aberdeen Series	Rheumatic fever and chorea	85	77 %	23 %
	Controls (corresponding ages)	25	32 %	68 %
	Chronic infective arthritis	80	76 %	24 %
	Controls (corresponding ages)	25	24 %	76 %
	" Streptococcal " diseases	18	69 %	31 %
Buxton Series	Subacute rheumatism	154	34 %	66 %
	Chronic infective arthritis	137	28 %	72 %
	Controls (osteo-arthritis)	30	0	100 %
Intradermal Test with Streptococcus viridans Extract				
Aberdeen Series	Rheumatic fever and chorea	60	27 %	73 %
	Controls (corresponding ages)	25	24 %	76 %
	Chronic infective arthritis	80	11 %	89 %
	Controls (corresponding ages)	25	20 %	80 %
	" Streptococcal " diseases	18	38 %	62 %
Buxton Series	Subacute rheumatism	154	3 %	97 %
	Chronic infective arthritis	137	9 %	91 %
	Controls (osteo-arthritis)	30	3 %	97 %

diseases and the control series. The results of these intradermal tests therefore support the view that haemolytic streptococcal infections are more frequent in rheumatic diseases than in the rest of the population. The higher incidence of positive skin tests in Aberdeen is partly explained by the higher concentration of the antigens employed, as is clearly demonstrated by the control figures—namely, approximately 30 per cent. positive in Aberdeen and 0 per cent. in Buxton. There is, however, an additional explanation of great interest.

Correlation of Clinical Findings

TABLE V

	No. of Cases	Progressive			Stable			Unstable		
		No. of Cases	Positive	Negative	No. of Cases	Positive	Negative	No. of Cases	Positive	Negative
Subacute rheumatism	154	88	1.2%	98.8%	27	88.8%	11.2%	39	71.7%	28.3%
Chronic infective arthritis	137	86	2.5%	97.5%	32	84.5%	15.5%	19	58%	42%

Table V shows a classification of the Buxton series of cases into progressive, stable, and unstable, a classification which is based on clinical data. " Progressive " indicates a stage of the disease at which several joints are involved and the process is in a very active state. In the stable or inactive stage pain and swelling are absent from all joints ; and in the unstable stage there is intermittent involvement of one or two joints, but the disease is at a comparatively quiescent phase. It will be seen that a high proportion of the stable and unstable forms of both diseases give positive reactions, the figures being actually higher than those in the Aberdeen series. In striking contrast the incidence of positive reactors in the progressive group is very low.

Two possible explanations of the latter finding can be suggested: (*a*) that in the progressive forms of the disease the organism concerned is one other than the haemolytic streptococcus, or (*b*) that the negative skin test indicates a lack of antibody formation to the endotoxin of the *Streptococcus haemolyticus*, it being assumed that for a positive reaction to appear both toxin and antitoxin must be present. In the stable inactive stage, where adequate anti-endotoxin has presumably been formed, positive skin tests appear in a high proportion of cases.

An inspection of the results of intradermal tests in the Aberdeen series tends to support this latter view, as negative intradermal reactions to the haemolytic streptococcus were most often found in severe progressive cases ; moreover, cases which have been studied in Aberdeen over a long period have shown a negative skin test at a progressive stage of the disease, and a positive one months later, when the disease had settled down.

A study of the case records at Buxton and Aberdeen indicates a higher proportion of progressive cases in the former centre. Accordingly the higher percentage of positive skin tests in the Aberdeen series can be explained partly by the difference in the strength of the haemolytic streptococcal extract used and partly by the lower activity of the disease at the time the tests were performed.

Discussion

While it must be admitted that the aetiology of chronic infective arthritis has not yet been elucidated it is probable that for its production several factors are essential. It is unnecessary to deal in detail with this subject here, since our views have been recently published.[3] The constitutional factor, as emphasized by an abnormal capillary circulation, often from childhood, is of great importance. When a person with this type of constitution is exposed to factors such as cold, damp, occupational strain, or infection, singly or in combination, a chronic arthritis is apt to appear far more often than in an ordinary individual. Of the factors which predispose to arthritis we believe infection to be the most important, and of the many organisms which can sensitize the predisposed individual the above evidence incriminates the haemolytic streptococcus as the most frequent infective agent.

Summary

1. The evidence favouring the view that some aetiological correlation exists between rheumatic fever and chronic infective arthritis is discussed.

2. An investigation of 500 cases of acute and chronic " rheumatic " diseases is reported, with particular reference to the immunological evidence of previous haemolytic streptococcal infection. Agglutination and anhaemolysin estimations, and intracutaneous and intravenous tests for sensitivity to the haemolytic streptococcus indicated that previous haemolytic streptococcal infections had been more common in patients with " rheumatic " diseases than in a control series of healthy individuals comparable as regards age and social circumstances.

In the case of one of us (W. G.) the work has been carried out under tenure of a Fellowship granted by the R. J. St. L. Harmsworth Memorial Fund.

We wish to express our indebtedness to Professor L. S. P. Davidson for his help in directing this work and in the preparation of this paper ; and to the physicians of the Devonshire Royal Hospital for allowing us to investigate the cases under their care.

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THE MEASUREMENT OF MUSCLE TONUS

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Muscle tonus influences many of the bodily functions, and attention has recently been directed to the importance of hypotonia as a cause of post-operative atelectasis and circulatory failure.[1] Accordingly, a method for the measurement of muscle tonus is greatly needed, and much work has been done with this object in view. The elastometers of Wertheim Salomonson, Noyons,[2] Mangold,[3] and Gildemeister[4] are ingenious pieces of scientific apparatus, but are open to so much criticism that they have never come into general use. Gildemeister's method of measuring tonus by means of a hammer and ballistic galvanometer has been used clinically by Springer,[5] Hosiosky,[6] and others,[7] but the readings obtained in this way vary considerably with the amount of subcutaneous fat present in the part under observation. The use of such apparatus shows the resistance of the tissues to a deforming force, and cannot be claimed to give an accurate estimate of muscle tonus. The elaborate apparatus of Fenn and Garvey[8] is of value for research rather than for clinical purposes. In fact the only practical method available at the bedside has been until recently the estimation of the degree of passive movement obtainable at the joints. By this means gross hypotonia could be appreciated, but could not be recorded graphically.

It is scarcely necessary to emphasize the fact that there is always a certain tonic longitudinal pull exerted by the bundles of fibres in a muscle, even when at rest. The internal pressure is therefore dependent upon the tonicity of the fibres, and varies throughout the body according to the state of contraction or relaxation present. However, by ensuring that the muscle examined is relaxed these variations can be avoided, and an estimate obtained of the degree of tonus present in that particular muscle. This enables the variations in tonus produced by different general conditions to be studied.

The method recently described by Yandell Henderson and his co-workers[9] is based upon this fact, and depends on measuring the pressure required to induce a minute amount of saline to run through a hollow needle introduced into the body of a muscle. The principle of the method is that the fluid will exert a side-thrust on the muscle fibres, tending to displace them, and that this displacing force will be resisted by the tonicity of the fibres. This represents an entirely new way of approaching the problem, and confirmation of its utility becomes necessary. An investigation based on these conclusions has already been carried out, and consistent results seem to have been obtained.[10] However, little attention has been paid to the variations produced by disease and their bearing on prognosis and treatment. The purpose of this paper is to determine the suitability of the apparatus for use as a clinical instrument and to discuss some of the problems which have arisen during the investigation.

The Original Procedure

Apparatus.—A No. 4 serum needle is used for insertion into the muscle. To obviate the risk of the needle becoming blocked by a small portion of muscle tissue it is recommended that the end of the needle should be blocked with solder, and three holes made at the side, near the point, by means of a file. In our experience the danger of the needle, thus weakened, breaking during use is more apparent than real. A piece of capillary glass tubing of 1 mm. bore and 5 cm. length is inserted into the butt-end of the needle, having been previously ground so as to give an accurate junction. The pressure is measured by a U-tube water manometer, graduated from 0 to 200 millimetres, which is connected to the glass tube by means of thick rubber tubing. By turning a fine thumbscrew a rubber bulb, attached at the bend of the U, is compressed, thus filling the manometer with water to any desired level.

Method.—The left biceps was chosen by the original workers as being the most convenient muscle for examination in this way. This choice has been adhered to in the present series, except where the presence of a skin affection or other local lesion has rendered the choice of the right biceps more advisable. The subject lies on his back. An area of skin over the left biceps is sterilized in the usual way and anaesthetized with novocain. The arm is flexed to about 135 degrees to ensure relaxation, and the needle to be used is filled with saline and thrust into the muscle. The glass tubing is filled to about two-thirds of its length with saline solution, and then inserted into the butt of the needle. This degree of filling is best obtained by using a hypodermic syringe with a needle sufficiently fine to be introduced within the bore of the glass tubing. The free end of the glass tubing is now connected to the manometer. One observer raises the pressure in the manometer by rotating the thumbscrew, while a second watches the fluid meniscus until it starts to move. When this occurs he signals to the first observer, who reads the pressure recorded by the manometer. It is this first movement of the meniscus, indicating that intramuscular pressure has been overcome, that is taken as representing the existing degree of tonus. The first reading is discarded and an average is taken of the next three.

The Modified Procedure

We have obtained good results by using the apparatus as described, but certain minor disadvantages have been apparent. Some difficulty was encountered in grinding the glass tubing to make an accurate junction with the needle. Moreover, capillary attraction proved troublesome when using tubing of such a fine bore as 1 mm. Accordingly we substituted a glass tube of 2 mm. bore, furnished with metal adapters at the ends: no loss of efficiency resulting from this alteration has been noted.

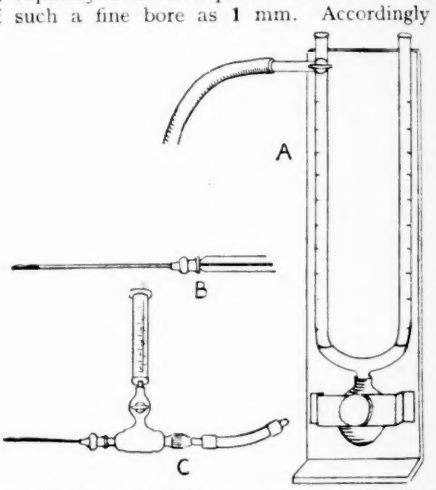

Diagram showing: A, Water manometer. B, Needle and capillary glass tubing as originally described. C, Author's modifications. (Not drawn to scale.)

Since the manner of filling the glass tubing also proved somewhat inconvenient, a reservoir was added to the apparatus. A metal T-piece, with a cock on the vertical limb, was inserted between the needle and the glass tubing, and the barrel of the 1 c.cm. syringe was attached to the vertical limb, so providing a convenient reservoir. By turning the cock the apparatus can be filled with saline to the desired level with the needle *in situ* and without disconnecting the manometer.

Results

The apparatus as described is inexpensive and easy to construct. Little dexterity is required for its use, and this is especially true if the suggested modifications are

adopted. The operation is almost painless where the skin has been adequately anaesthetized, and for this purpose a delay of at least five minutes is recommended between the infiltration of the skin with novocain and the insertion of the needle. Apart from this the time taken to obtain a reading is small, and twenty minutes should suffice for the examination of half a dozen patients. Consistent results are obtained in the one individual, but in this connexion we are not sure that differences of less than 5 mm. of water are significant.

Altogether the simplicity of the apparatus and the absence of technical difficulties make the method eminently suitable for use at the bedside. A number of readings have been carried out on some 200 individuals, mostly patients in general medical wards, and the occurrence of hypotonia has been noted. No attempt has been made in the present series to measure increased tonus occurring in cases with evidence of spasticity. Henderson, Oughterson, Greenberg, and Searle[9] obtained readings of between 60 and 90 mm. in ten healthy young men, and these figures correspond closely with those which we have obtained in convalescent patients who could reasonably be regarded as being in good health.

Grouping of Cases

The present series is too small to permit of any classification of results on an aetiological basis. Indeed, it does not appear that this would be of any value, since hypotonia in a greater or less degree is a result of many diseases, and not a specific result of any one ailment. For the purposes of this investigation the clinical condition of the patient at the time of examination has been used as a basis for tabulating the results.

Working on this principle three groups have been established. Group 1 consists of persons who have come under observation on account of some symptom which has not appreciably impaired their vitality. Patients who are obviously ill but not in immediate danger of death constitute Group 2. Group 3 includes all cases where the illness is grave. Typical findings are shown in the following table.

Table I

Group 1		Group 2		Group 3	
Fibrositis	60	Myxoedema	20	Auricular fibrillation	60
Glycosuria	75	Arthritis	40	Nephritis	20
Peptic ulcer	80	Paget's disease	100	Empyema	15
Anxiety neurosis	70	Carcinoma of lung	60	Mitral disease	65
Hyperpiesis	90	Osteomalacia	45	Hemiplegia	30
Normal	90	Splenic anaemia	85	Haematemesis	25
Abdominal pain	75	Acute rheumatism	50	Pulmonary tuberculosis	60
Syphilis	75	Syphilitic aortitis	60	Diabetic gangrene	50

Readings in millimetres of water.

It will be noticed that, although marked illness usually depresses muscle tone, the degree of depression does not correspond to the clinical condition. This is contrary to the findings of previous observers.[9] Moreover, in our experience, during the course of non-survival experiments on the cat, the readings obtained with this apparatus in no way correspond with the physical condition of the animal.

In hospital wards we have repeatedly observed that moribund patients may give higher readings than those whose condition does not give rise to immediate anxiety. Furthermore, low figures may be obtained where the only complaint is that of weakness and where objective findings are negative. Accordingly we do not regard the measurement of muscle tonus in this way to be of any value in prognosis.

This conclusion is not surprising, since it is not to be expected that any one clinical finding would prove to be of constant value for this purpose. On the other hand, in certain cases hypotonia as demonstrated by this method has been the only positive finding, and we have been able to show and measure disturbance of function in a number of so-called neurasthenics. This is regarded as an important result, since it provides a ready means of following the progress of the case and of estimating the response to treatment without the necessity of relying solely on the patient's statements as to improvement.

The number of patients diagnosed as suffering from neurasthenia has been greatly reduced since the recognition and better comprehension of the anxiety states. This reduction, however, still leaves many cases which cannot be classified under any other heading. The introduction of any device which enables positive findings to be obtained in such cases cannot but be valuable. It may be mentioned in passing that many of these individuals had very active tendon reflexes in spite of depressed muscle tonus.

Influence of Circulatory Depression

Henderson[11] has shown the effect of tonic muscular contraction in promoting a continuous flow of blood through the veins to the heart, and has emphasized the importance in the maintenance of the circulation of this factor, which he terms the "veno-pressor mechanism." Following on the work of Riml[12] it has been shown[9] in the case of the cat that this pressure alone is sufficient to drive one-quarter of the blood volume into the right heart in a few seconds. Therefore it would be reasonable to expect that some degree of circulatory failure would be apparent in those cases which showed marked hypotonia.

Table II compares the findings in patients suffering from obvious cardiac disease with those obtained in certain cases where the heart was unaffected.

Table II

Patients with Heart Disease		Patients without Heart Disease	
Auricular fibrillation	55	Asthenia	40
Coronary thrombosis	30	Pulmonary tuberculosis	50
Myocarditis	80	Secondary carcinoma	30
Heart block	90	Post-pneumonic asthenia	25

Readings in millimetres of water.

The difference in the clinical condition of those two groups was striking. In the one dyspnoea, oedema, and tachycardia were prominent features, while in the other there were no obvious signs of cardiac distress, and yet hypotonia was marked. At first sight it would appear that the importance of this "veno-pressor mechanism" has been exaggerated, but on examining the matter more closely a different conclusion was reached.

All these hypotonic individuals with no apparent heart lesion showed some distress on exertion. Palpitation, weakness, and dizziness were complained of, and the pulse rate returned to normal somewhat slowly. In other words, they resembled those cases variously described as neurocirculatory asthenia, effort syndrome, or disordered action of the heart. Further research on this point is required, but it is suggested that a number of cases of neurocirculatory asthenia are, in fact, suffering from depressed muscle tonus resulting in defective venous return. The primary cause of this hypotonia might be ascribed to the existence of some previous or concurrent infection.

Summary

The measurement of muscle tonus is discussed, and the utility of a previously described method is confirmed. Modifications of the original apparatus are suggested.

Findings obtained in a series of some two hundred patients are analysed and considered with regard to prognosis.

Observations are made on the relation between hypotonia and certain disease syndromes.

The influence of the "veno-pressor mechanism" on the circulation is investigated.

Our thanks are due to Professor E. P. Cathcart, Professor Yandell Henderson, and Professor T. K. Monro for advice, assistance, and access to patients.

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Clinical Memoranda

Acute Puerperal Inversion of the Uterus

Acute inversion of the uterus, one of the rarer complications of labour, is said to occur in England in the proportion of one in about every 200,000 deliveries. While it is impossible to obtain figures for less civilized countries, it may be imagined that the proportion in Central Africa is somewhat higher, since one of the known factors in the aetiology of the condition—namely, traction on the cord—is commonly practised by primitive peoples when the birth of the placenta is delayed.

The patient who is the subject of this note was admitted to hospital on the morning of May 30th, 1936. She was a healthy woman of about 25 years of age and had two children aged 7 and 5 years. There was nothing abnormal in her obstetric record as far as she was aware, and her health during the present pregnancy had been normal. The period of gestation was approximately forty weeks.

Pains had begun "in the middle of the night" (it being impossible to determine the exact hour in the absence of clocks in native huts), and had been of average intensity and frequency. At sunrise (about 6 a.m.) the membranes ruptured, and the baby was born immediately, vertex presentation. The placenta not being born within a short time, the attendant native woman had exerted traction upon the cord until the placenta was delivered. The delivery of the placenta was followed by a brisk haemorrhage, which, however, ceased spontaneously within a few minutes. During the next half-hour a swelling gradually appeared at the vulva, and then presented outside the vulval orifice. In accordance with native custom in any abnormal circumstances, the extruding part was liberally sprinkled with leaves and grass, and an attempt was made by the native women to press back the extruded organ. This attempt had succeeded only in rendering more oedematous the prolapsed parts and in tearing the epithelium in one or two places. The patient was then hurriedly brought from her village to the hospital.

On examination soon after 8 a.m. I found that the general condition of the patient was fairly good despite her clinical state and the drastic treatment to which she had recently been subjected. Her extremities were rather cold, but the pulse and blood pressure gave no cause for undue concern. The uterus was just palpable behind the symphysis pubis through the very lax anterior abdominal wall. The external os could be seen outside the vulva as a very oedematous ring of tissue, purple in colour, and bleeding slightly posteriorly where the epithelium had been abraded. Within the cervix the uterine wall could be seen prolapsed, with its characteristic fleshy rugae. An extent of about three inches of the anterior (inner) surface of the posterior wall of the uterus was thus visible, including a portion of the placental site at its upper limit.

In view of the good general condition of the patient and the possibility of the cervical tissues becoming more oedematous, I decided to attempt early replacement of the parts. Under chloroform anaesthesia the toilet of the vulval region was performed, and a brisk lysol douche given to remove grass and leaves adherent to the inner surface of those parts of the maternal passages visible outside the vulva. The cervical tissues were then carefully and gradually compressed in order to express some of the oedema, and gentle pressure was exerted on the cervix and on the wall of the uterus. After about fifteen minutes of steady taxis the parts resumed their normal relation. The operation concluded with a hot lysol douche and an injection of pituitary extract to promote optimum uterine retraction. A firm binder was placed around the abdomen and thighs, and the ankles tied together to prevent abduction of the legs. The patient stood the operation well, and was only slightly shocked on leaving the theatre.

The post-partum history was uneventful, the lochia being normal in appearance, quantity, and duration, and the temperature never rising above 99° F. Subsequent vaginal examination during the second week revealed no abnormality: involution had proceeded in normal fashion, and the uterus was normal in form, size, and position, and did not prolapse on straining. When she left hospital with her six and a half pound male child, the mother appeared none the worse for having experienced one of the rarest complications of labour.

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Complete Repair of "Mallet Finger"

This case may be of interest as one of complete repair following the condition of "mallet finger." The prognosis here is by no means good; complete return of function but rarely occurs, the tendon usually uniting in an overlengthened condition.

Some weeks ago, while casualty house-surgeon at St. Bartholomew's Hospital, I suffered an accident to my right hand, which resulted in the tearing of the insertion of the extensor tendon of the index finger, the condition of "mallet finger" (or "baseball finger" as it is termed in America) immediately developing. The diagnosis was confirmed by an orthopaedic surgeon.

The finger was at once radiographed to eliminate injury to the bone, and was then put in an emergency splint to prevent tension on such fibres of the extensor tendon as (it was hoped) were still intact. Two days later a light aluminium splint of the "thimble" pattern was made, and this maintained the terminal phalanx in as great a condition of hyperextension as was possible. This splint was worn continuously for six weeks without its ever being removed, merely being covered with a rubber finger-stall when I wished to wash or protect it in any way.

At the end of six weeks this splint was removed. Stiffness passed off after three days of gentle movements of the terminal interphalangeal joint, and by the end of a week the movement of the finger was normal. A tendency was noticed, however, for the finger to assume a slightly flexed condition towards the end of the day, so for the first two weeks following its original removal I took to wearing the splint again at night. The present condition of the finger is such that it is normal in every way as compared with the other hand.

The lesson to be learnt from this is, I think, that a poor result in these cases must usually be due to lack of co-operation on the part of the patient and failure to carry out the instructions of the surgeon in every detail. I attribute the whole success of this treatment to maintaining complete hyperextension of the joint continuously for six weeks.

Basil Merriman, M.R.C.S.

Reviews

PLAGUE

Drs. Wu Lien-Teh, J. W. H. Chun, R. Pollitzer, and C. Y. Wu of the National Quarantine Service at Shanghai, encouraged by the success of their monograph on cholera, have again collaborated to produce *Plague*.[1] These four authors form the spearhead of Chinese scientific investigation in modern epidemiology. The terrible pneumonic plague of 1910–11, which caused 65,000 deaths in Manchuria, followed as it was by an International Plague Conference at Mukden, gave China its first impetus to the study of epidemic outbreaks. The visit of leading foreign pestologists impressed Chinese medical men of the younger progressive school, and secured the encouragement of their Government. This book is the outcome of that movement, and it reflects great credit on all concerned for its comprehensiveness and documented details: it embodies results of the latest published researches, which form the authors' theoretical background in the course of their practical work. His Excellency Dr. Heng Liu, Minister of Health, contributes a foreword in which he hopes that in the near future "this dreaded but perfectly preventable disease will completely vanish." But this sanguine hope does not quite take into account the irresistible forces of nature, the economic and social factors, and the protean character of plague, which make effective prophylaxis a baffling problem that will probably remain unsolved so long as rats and rat-fleas trouble the world.

After the general introduction and a historical chapter by Dr. Wu Lien-Teh, plague bacteriology and immunology are dealt with by Dr. Pollitzer. He shows how intimately related *Pasteurella pestis* (the modern name of plague bacillus) is to the group of haemorrhagic septicaemic pasteurellae. Plague pasteurella stands so particularly close to the pseudo-tuberculosis bacillus (*Past. pseudo-tuberculosis rodentium*) that they are not definitely distinguishable one from the other by the serological methods practised at present. Hosts and carriers are described by Dr. Wu Lien-Teh, while Dr. J. W. H. Chun writes on clinical features and Dr. C. Y. Wu deals with the epidemiology and general prophylaxis and management of epidemics. No original cases of primary pneumonic plague have yet been established. Epidemics of this type are due to chance or solely extrinsic causes. The fundamental problem of ship-borne plague lies in preventing the access of rodents and fleas to vessels; human bubonic cases or fomites have little or no practical significance in transmitting infection. The treatment of plague is at times well-nigh impossible, especially so in pneumonic plague; serum shows varying results and has its limitations; bacteriophage does not influence the course of the disease.

Of the different rat-flea species the authors find that the Indian rat-flea, *X. cheopis*, is the vector *par excellence*. It is the predominant species in India, Java, Egypt, and China. Though the authors have added comparatively little fresh knowledge they have succeeded in collating a great amount of recent pestological information, and from the experience gained in the almost annual outbreaks (mostly of bubonic plague) in China and Manchuria they have been able to make comparative analyses. This book is a thesaurus which will be found serviceable by plague workers throughout the world. It is well illustrated, and has full bibliographical references.

[1] *Plague. A Manual for Medical and Public Health Workers.* By Wu Lien-Teh, M.A., M.D., J. W. H. Chun, M.B., B.C., R. Pollitzer, M.D., and C. Y. Wu, M.B., B.S. Shanghai, China: Weissengshu National Quarantine Service; London: H. K. Lewis and Co. Ltd. (Pp. 547; 103 figures. Price in China, 10 dollars post free; in England, 15s. post free.)

INTRODUCTION TO PSYCHIATRY

Drs. R. G. Gordon, N. G. Harris, and J. R. Rees have written *An Introduction to Psychological Medicine*[2] which is intended for the use of medical students. A few years ago it was felt that the medical student should be given a more rational education in psychological medicine. A few demonstrations in a mental hospital do not impart the knowledge which the student needs when he begins to practise. Some knowledge of the psychoneuroses is essential, because a considerable number of his patients will be mentally rather than physically ill, and therefore some teaching and demonstrations should be included in the curriculum. In recent years it is satisfactory to know that most teaching hospitals have established a department which deals with the "minor psychosis." The authors do not consider that psychotherapy should be included in the curriculum. What the medical student requires to know is the structure and function of the normal, how healthy processes go wrong, and hence what is the nature of disease. Given this knowledge, the authors feel that diagnosis will be relatively easy and appropriate treatment not hard to apply. The text is clearly written on conventional lines, and appears to include what is necessary for the student. If it is possible it would, of course, be a great advantage to the young graduate to take a course in psychotherapy at one of the many psychological clinics.

LABORATORY PRACTICE FOR PUBLIC HEALTH OFFICERS

Laboratory Practice,[3] by Professor J. R. Currie, may be regarded as a companion volume to the author's *Textbook of Hygiene*, and is intended for the same class of student—namely, those persons who have taken a registrable medical qualification and who desire to sit for the Diploma in Public Health. It contains chapters on chemistry, bacteriology, protozoology, helminthology, entomology, and meteorology which embody sufficient material to cover the course for Part I of the D.P.H. so far as these subjects are concerned. The only subjects for that examination which are not dealt with in the textbook under review are radiology and electrology and biochemistry in its application to nutrition; and these are omitted, we think rightly, on grounds which are explained in the introduction. Of the six headings into which the book is divided most space is devoted to chemistry and bacteriology as being subjects most likely to occupy the interest of a medical officer in a public health department practising in this country. A particular feature of the sections on helminthology and protozoology is the diagrams, which are clear and accurate and well annotated.

One of the difficulties facing an author who proposes to write a textbook on any public health subject is the rapidity with which changes are taking place not only on the legal side but almost equally so on the more purely scientific side. Professor Currie, who makes no claims to prophesy the course of future developments, has to a large extent succeeded in including the latest information in his book, either in the text or in the footnotes. Thus the reductase test on bacterial activity in milk is described together with Wilson's opinions of it as contained in the Medical Research Council's report published in January, 1936. The phosphatase test, now coming into use in connexion with laboratory control as

[2] *An Introduction to Psychological Medicine.* By R. G. Gordon, M.D., D.Sc., F.R.C.P.Ed., N. G. Harris, M.D., B.S., D.P.M., and J. R. Rees, M.A., M.D., D.P.H. London: H. Milford, Oxford University Press. 1936. (Pp. 386. 10s. 6d. net.)

[3] *Laboratory Practice.* By J. R. Currie and Contributors. Edinburgh: E. and S. Livingstone. 1936. (Pp. 378; 169 figures. 21s. net.)

to the efficiency of pasteurization, is not, however, mentioned.

Throughout, the book has been written as a textbook as well as a book of reference for those preparing for or actively engaged in the public services, and much is therefore omitted, especially in the sections on chemistry and bacteriology, that is only of interest to specialists in particular subjects. The medical officer of health normally has to be neither a chemist nor a bacteriologist. What he is expected to be able to do is to understand chemical and bacteriological methods, and the uses to which they can be put in connexion with the administrative procedures necessary to safeguard the health of a community. With this limitation in mind Professor Currie and his collaborators have written a textbook which very adequately discusses a number of subjects related to each other indirectly through their bearing on public health methods.

This is a valuable book, and will be welcomed by medical practitioners engaged in the public health service.

UROLOGY

The "Recent Advances" series is too well known to need any introduction or recommendation. In the latest volume—on genito-urinary surgery[4]—Messrs. Hamilton Bailey and Norman M. Matheson have fully maintained the high level of usefulness set by previous authors. The work is strongly to be recommended, for it sets forth the important advances that have been made in urinary surgery during the past decade in a clear and concise manner. Nothing of importance has been omitted, and the descriptions are sufficiently clear and detailed to render it unnecessary for one to look up the original articles. On the other hand the short bibliography given at the end of each chapter mentions most of the important papers on the subject, so that the surgeon who wishes to keep abreast of the times need rarely go beyond its limits. The book is thus a real time-saver.

The volume opens with chapters on intravenous pyelography, renal function tests, and the treatment of uraemia. These are followed by a series of chapters on diseases of the urinary organs—kidney, ureter, bladder, etc.—which form the great bulk of the work. The arrangement is good, and there is no overlapping of detail.

SURGICAL TREATMENT OF TOXIC GOITRE

Bérard and Peycelon have written a monograph on the surgical treatment of Basedow's disease and toxic goitre[5] which summarizes very clearly the attitude which surgeons should adopt towards these conditions in the light of our present knowledge of their pathology. They point out that whether the goitre is large or small, of recent development or of old standing, soft or fibrotic, diffuse or nodular, the presence of toxic manifestations is the result of the same toxin in all cases, and though toxicity may vary in its intensity the problem of treatment always resolves itself into the determination of the safest and quickest method of reducing the quantity of this one toxin in the body. It is important that this principle should be recognized, for in the past it has been suggested that various clinical manifestations were the effects of different chemical bodies formed in the diseased thyroid gland. We cannot agree, however, with the statement that tuberculosis and syphilis are aetiological factors of any importance in toxic goitre.

An excellent account is given of the measures which have been introduced during the past twenty years to render the patients safe for operation—preoperative rest, iodine, sedatives, and cardiac tonics; and to make the operation of thyroidectomy safer—choice of anaesthetic, control of haemorrhage, preservation of the recurrent laryngeal nerves, and operating in multiple stages. The omission of avertin is rather surprising, and the authors perpetuate the fallacy that absorption of toxin from the wound is a cause of post-operative thyrotoxicosis, though they quite rightly stress the fact that an operation on any other part of the body may precipitate a post-operative thyroid crisis.

Operative technique is well described and clearly illustrated, and the monograph ends with an account of toxic symptoms occurring with carcinoma of the thyroid. More might have been said about the indications for surgery in the presence of glycosuria and mental disorder, but cardiac complications have been considered in a most convincing manner. The material has been well arranged, and an up-to-date bibliography of the French, English, and American literature adds appreciably to the value of the book.

A GERMAN TEXTBOOK OF MEDICINE

The new edition of Professor Domarus's textbook of medicine[6] carries on the tradition of the former ones. That already in the last thirteen years there has been the call for ten editions is evidence of the popularity of the book. By the judicious use of small print for details—yet not so small as to be difficult to read—the author manages in the space of 650 pages to cover well the whole field of internal or clinical medicine. The descriptions of diseases and their treatment conform with usual teaching, and the student will find in all sections a useful summary of present-day knowledge. It may be too much to expect from a handbook, but one finds in many places items of new work which have been before the profession long enough to make some attempt at a judgement on their value or importance, about which Professor Domarus has little to say. In the section on infectious diseases the discussion of agranulocytosis in relation to diseases of the bone marrow under the influence of sepsis leaves much more to be said in regard to aetiology. Coronary thrombosis is far more important in England than the author's description would lead us to understand it is regarded in Germany. There is mention of the Hijmans van den Bergh test for bilirubinaemia, but a quite inadequate description of the help it can give in differentiating various types of jaundice. The author describes a method of protein therapy for peptic ulcer, but makes no mention of the use of histidine, for which there seems to be a vogue with us at present. General bilateral haematogenous renal disease is described on accepted lines with a differentiation between secondary contracted kidney and vascular or arteriosclerotic contracted kidney. The old difficulty of fitting the clinical course to the observed post-mortem appearances has not been surmounted in regard to the cases the author brings together under acute or chronic Bright's disease. The nervous system is covered as well as possible in the limited space allowed; and in some places—for example, in the treatment of diabetes—it is remarkable how much sound teaching the author has packed in.

Professor Domarus planned his original edition with the object of presenting to medical students and young physicians the essentials of the theory and practice of medicine, and in spite of much addition and rewriting the new edition has maintained its character and remains a practical and handy volume.

[4] *Recent Advances in Genito-Urinary Surgery.* By Hamilton Bailey, F.R.C.S., and Norman M. Matheson, M.B., F.R.C.S., M.R.C.P. London: J. and A. Churchill, Ltd. 1936. (Pp. 213; 89 figures. 15s. net.)

[5] *Traitement Chirurgical de la Maladie de Basedow et des Goitres Toxiques.* By L. Bérard and R. Peycelon. Paris: Masson et Cie. 1936. (Pp. 180; 42 figures. 40 fr.)

[6] *Grundriss der Inneren Medizin.* By Dr. A. von Domarus. Tenth edition. Berlin: J. Springer. 1936. (Pp. 681; 63 figures. RM. 16.80.)

Notes on Books

Dietetics or Nutrition in Health and Disease,[7] by Dr. W. HEUPKE, is one of the series of monographs on medical practice edited at the Dresden Medical School. The general aim is to provide textbooks which will enable the practitioner of medicine to keep in touch with recent advances in medical science. The volume under review is excellently adapted for this purpose, since the author has given a clear and comprehensive account of his subject in less than 200 pages. In the first part we find a short summary (20 pages) of the general theory of nutrition. One-third of this is devoted to the vitamins, and the author has succeeded in giving a brief but very clear account of the vitamin requirements of man. The other main sections are the composition and characteristics of foodstuffs, nutrition in health, nutrition in disease, and artificial feeding. The section on nutrition in disease contains a clear and short account of all the chief forms of special diets such as diabetic, ketogenic, salt-poor, and obesity diets. The essential feature of a book of this kind is that it should provide an adequate amount of clear and accurate information, and the volume passes this test extremely well.

In the preface to his book, *A Short History of Tuberculosis*,[8] Dr. G. NORMAN MEACHEN states that he has endeavoured "to provide what Dr. Ernest Ward thinks all such studies should do—namely, 'interest, entertainment, and instruction.'" It is to be regretted that the author has not succeeded in any of these respects. Dr. Meachen does not appear to have made his mind up beforehand whether it was to be a history of tuberculosis in general or of tuberculosis in England, or whether the subject was to be treated in chronological order or according to the various problems presented by the disease. The style is difficult to digest, consisting mostly of single-sentence paragraphs, often bearing no relation to each other. Repeated quotation of other people's opinions and sayings produces an irritating effect, not lessened by such printing as "extrapleural resection of from 1 to 6 in. of ribs XI to I via a paravertebral incision." The space apportioned to various subjects or workers is often unrelated to their importance in the history of tuberculosis (thus Villemin's work is dismissed in ten lines), and some of the subject-matter is put down quite uncritically, as, for instance, that dealing with B.C.G. or with Spahlinger's vaccine. Nevertheless, the book should form a very handy volume for looking up dates and names connected with tuberculosis. It contains good photographs of Koch and Pirquet and an amusing plate of "Queen Mary touching a scrofulous boy."

Accurate dosage in radium therapy is so obviously important that Dr. KARL ZIMMER's excellent little monograph on Radium Dosimetry[9] will be welcome to all who are engaged in this branch of our profession. As it is a work of a highly specialized character, our notice of it must be brief, but brevity does not indicate a lack of appreciation. The monograph includes a critical study of the present position of the subject, and is furnished with an excellent bibliography.

The Normal and Pathological Physiology of the Movements of the Alimentary Canal,[10] by Professor W. CATEL of Leipzig, is a work whose scope is indicated by its title. The first part deals with the anatomy and normal physiology of gut movements and the second will be devoted to the derangements caused by disease. The author intends to include in the future the secretions and absorption from the gut, and thus to produce a textbook covering the physiology and pathology of all the gut functions. The part under review deals in a competent manner with the physiology of gut movements, and the text is supplemented by a large number of illustrations. The outstanding facts regarding the subject have been established for a number of years, and hence the account given does not contain many striking novelties. Some of the chief advances made in recent years are the recognition of the importance of movements of the muscularis mucosae and of the intestinal villi, the influence of vitamin lack on intestinal activity, and the study of the nervous control of the gut in primates. An adequate account of all these subjects is given.

The art of hydrotherapy requires for its practice not only knowledge but the skill that comes from daily experience. The attractive little textbook, by RUTH LE QUESNE and MARY GRANVILLE (Cassell, 6s.), like the late Dr. Calthrop's work, is founded on courses of teaching, in this case for the qualifying C.S.M.M.G. examination, in which hydrotherapy is now included. It should provide a sound basis for the "assistants" who aspire to be artists in hydrotherapy. One of the Continental pioneers in this method of treatment was accustomed to say that no physician could understand hydrotherapy unless he was prepared to put his own hands in the water. England in the nineteenth century had not a few lay practitioners of remarkable skill, although without scientific knowledge. The lay worker is now better provided, but it would seem a pity if this subtle and intricate art (for so these authors show it to be) should be left too much in non-medical hands. Most readers will be surprised at the wide range and application of the hydrotherapeutic method as here briefly described, and by the different reactions induced by small variations in temperature, duration, and technique. An excellent table sets forth the reactions of the "neutral" bath as compared with those which follow from baths at lower or higher temperatures.

[7] *Diatetik die Ernahrung des Gesunden und des Kranken.* By Dr. Wilhelm Heupke. *Medizinische Praxis*, Band XX. Dresden and Leipzig: T. Steinkopff. 1936. (Pp. 192. RM. 9.50; geb., RM. 10.80.)

[8] *A Short History of Tuberculosis.* By G. Norman Meachen. London: John Bale, Sons and Danielsson, Ltd. 1936. (Pp. 105; 4 figures. 3s. 6d.)

[9] *Radiumdosimetrie.* By Dr. Karl G. Zimmer. (Fortschritte auf dem Gebiete der Röntgenstrahlen Ergänzungsband 49.) 1936. Leipzig: G. Thieme. (Pp. 40; 33 figures. RM. 6.50.)

[10] *Normale und Pathologische Physiologie der Bewegungsvorgange im Gesamten Verdauungskanal.* By Professor Dr. Med. Werner Catel. Teil I. *Methodik, Anatomie, Normale Physiologie.* Leipzig: G. Thieme. 1936. (Pp. 250; 87 figures. M. 11.50; geb., M.13.)

Preparations and Appliances

CONCENTRATE OF RICE POLISHINGS

Ryzamin-B (Burroughs Wellcome and Co.) is a concentrate of rice polishings which contains fifty international units of vitamin B_1 per gram. The concentrate is a syrupy preparation which is quite palatable, and a daily dose of 0.4 gram is suggested as a supplement to the diet where this is partially deficient in vitamin B_1. In serious conditions, such as beriberi or late sprue, a daily dose of 4 grams or more is indicated.

The extent to which deficiency of this vitamin occurs in this country is well known to be a matter of dispute. Obvious signs of deficiency are very rare, but many authorities believe that a diet containing a large proportion of white bread is likely to cause enough deficiency in vitamin B_1 to produce derangement of the functions of the alimentary canal. Furthermore, the relation between various forms of polyneuritis and deficiency of vitamin B_1 is a problem which is at present attracting much attention.

CITRATED FERROUS CHLORIDE

Ferrous chloride (citrated) is a new iron preparation (British Drug Houses Ltd.) which promises to be of considerable service in the treatment of anaemia. In recent years it has been shown that preparations such as reduced iron, Blaud's pill, and iron and ammonium citrate are only effective when given in massive doses. The disproportion between the minimum effective dose and the maximum amount of iron absorbed is indeed very striking. It is believed that the absorption of iron depends on the formation of ferrous chloride in the stomach, and hence this salt appears to be the rational form in which to administer iron. Unfortunately ferrous chloride is easily oxidized to ferric chloride, and this has hindered its clinical use. The new preparation consists of tablets of citrated ferrous chloride, which are protected from oxidation by a coating of a special varnish. These tablets promise to provide an effective means of iron therapy which avoids the difficulties sometimes associated with massive treatment.

PUBLIC HEALTH IN THE UNITED STATES OF AMERICA*

IV.—HOSPITAL PROBLEMS

BY

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The material for this article is derived from information obtained during visits to certain hospitals in the U.S.A., discussions with representatives of the American Medical Association, the American Hospital Association, the Commissioner for Hospitals of New York City, and others, supplemented by facts contained in a recently published and very detailed survey of certain aspects of hospital provision by Dr. Rorem.†

Registration

As in so many other American affairs, non-governmental bodies appear to exercise a powerful influence upon hospital conduct. Hospitals are "approved" by the American College of Surgeons or "registered" by the American Medical Association. The latter body constantly employs three inspectors of hospitals, as the result of whose reports hospitals are registered and certificates issued to that effect. One may see its certificate framed and prominently exposed in the room of the chief administrative officer even of a large and modern teaching hospital. In 1928, 6,852 hospitals, containing 892,934 beds (excluding 43,313 bassinets) had been so recognized, while 458 hospitals with 12,754 beds had been refused registration. Roughly, therefore, there are more than 7,000 hospitals of one kind or another with 900,000 beds in the U.S.A.

Classification

Obviously the groupings into which hospitals may be placed are legion, and broad classifications only will be used here. Most of the terms used are self-explanatory, but certain categories require elucidation. Quite a number of hospitals are described as "institutional." These are attached to schools, orphanages, homes for the aged and infirm, prisons, or reformatories, and are reserved for the inmates of such institutions. It would appear that the sick wards of our Poor Law institutions would be included in this group if they were in America. Proprietary hospitals are those which are recognized on a business basis for private profit. It is difficult to arrive at a clear-cut distinction between some hospitals whose managers might, if they wished, but do not, make profits, and those which may strictly be described as voluntary in our sense of the word. The figures given as to this group must therefore be taken as approximations. Some are attached to works and are reserved for their employees, but the majority seem to be comparable with institutions requiring to be registered in this country under the Nursing Homes Registration Act. The group comprised under the heading governmental includes federal, State, and local authority hospitals; the Federal Government actually maintains 294 hospitals, mainly for its own employees, while about 40 per cent. of the remaining governmental hospitals are under State administration. General hospitals include beds for acute infectious disease, which, it has already been noted, are not very numerous.

The following table shows the distribution in broad groups of the 6,852 "registered" hospitals in 1928:

	General		Special		Nervous and Mental		Tuberculosis		Institutional		Totals	
	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds
Governmental ...	772	115,037	127	12,335	307	376,022	282	46,293	325	17,747	1,813	567,434
Voluntary	1,889	197,407	333	23,324	69	11,101	103	10,088	210	6,050	2,604	247,970
Proprietary	1,877	58 169	259	7,129	177	6,614	122	5,618	—	—	2,435	77,530
Totals	4,538	370,613	719	42,788	553	393,737	507	61,999	535	23,797	6,852	892,934

Comparison with England and Wales

With the obvious comment that within any one country the term hospital covers a great variety of type and quality of institution, and that it does not mean exactly the same thing in different countries, rough comparisons may be made with the provision in England and Wales. According to the Chief Medical Officer of the Ministry of Health there were 1,846 hospitals with 215,450 beds in England and Wales in 1933, exclusive of mental institutions and fever hospitals. The number of beds per 1,000 of the population was therefore roughly 5.3. If from the American figures for 1928 those bearing on mental hospitals are removed and all proprietary hospitals are disregarded, 4,041 hospitals having 428,281 beds are left, and the number of beds per 1,000 of the population is approximately 3.6. It seems likely that some of the larger so-called proprietary hospitals in America should be included in order to reach a rate truly comparable with ours, but the data are not available for making such a selection.

Governmental and Voluntary Hospitals

If proprietary hospitals are still ignored but mental hospitals counted, nearly 70 per cent. of the beds in the U.S.A. are seen to be provided and maintained out of governmental funds. When mental hospitals are removed, this percentage drops to 45, and, if the comparison is confined to general hospitals, it falls further to 37. In England and Wales 67 per cent. of hospital beds, not including mental and fever hospitals, are provided and maintained from rates, and for general beds alone the percentage is 70. The figures from which this latter proportion is calculated are weighted by a number of beds in Poor Law institutions of doubtful quality.

The considerable number of voluntary beds for tuberculosis in America—over 20 per cent. of the total for this disease—will also be noted. Incidentally it may be mentioned that a large proportion of the proprietary beds for tuberculosis, which strike one as surprisingly numerous, are situated in Arizona, California, and South Carolina, and some of them can hardly be regarded as more than boarding-houses.

* This is the fourth of a short series of articles on public health in the U.S.A., contributed by invitation.

† *The Public's Investment in Hospitals.* By C. Rufus Rorem, Ph.D. The University of Chicago Press. ($2.50.)

Hospital Planning

A large proportion of all the hospitals in the U.S.A. are comparatively small institutions of less than a hundred beds. In architectural design and in the use of building material they tend to conform to the building practice of the district in which they are situated. There is, however, a far greater inclination than can be observed here to depart from large wards in their design. In the bigger modern hospitals a unit usually consists of a group of small wards and ancillary rooms on either side of a central corridor, which ends in a ward for about four to eight patients with a solarium.

As with all public buildings in large cities, the present tendency is to economize in ground space by vertical construction. It is obvious that, with high-speed elevators, this type of construction facilitates communication and general administration. It has been suggested, although there does not appear to be agreement on the point, that such hospitals cease to be economical after about eleven or twelve stories in height have been exceeded.

The advantage of grouping a number of hospitals, general and special, on a common site is being realized. As already indicated, it is not considered inappropriate to accommodate infectious disease in an annexe of a general hospital. The Hospital Centre at New York is an outstanding example of the application of the principle of grouping, a large site being partly occupied by a number of hospitals, general and special, and partly reserved for the erection of new units. An interesting variant may be seen at Rochester, N.Y., where the Strong Memorial Hospital, a voluntary institution, the Municipal Hospital, and the Medical and Dental Schools are virtually one building under common medical and nursing administration. Both as regards co-ordination of public and voluntary service and professional education, and also from the structural point of view, the Rochester " medical group " deserves study by any community in our country fortunate enough to be in a position to consider new, or large extension of, both its public and voluntary provision at the same time.

Hospital Costs

Apart from the fact that initial costs of construction never represent the total amount of capital sunk in a hospital after it has been in existence for some years, the purpose a hospital has to serve and the area in which it is situated affect its cost so greatly that average figures have little meaning. The matter does, however, deserve brief examination, in view of the rather high cost of house-building in America, varying from about £800 to £1,100 for small workers' dwellings whether in town or in country. It would appear that the small type of hospital of fifty beds or less, so common in America, can be erected without furnishing and equipment for about $3,500 to $4,000 per bed, or £700–£800 at the present rate of exchange. On the other hand, a recent tender for a modern hospital of one hundred beds in New England amounted to $935,000, or roughly £1,870 per bed, and this appears to be not unusual for new hospitals in teaching centres, with their elaborate lay-out and provision for the large staff which they usually carry. The cost has increased greatly during the present century.

The average cost of maintenance throughout the U.S.A. is said to be about $3.50 per patient per day, or roughly £5 per week, but here again there is great variation. For instance, the patient-week cost at New Haven Hospital, the centre of the Yale School of Medicine, is roughly £9. At Cincinnati Municipal Hospital, the teaching hospital for the medical school of that city, the cost is said to be little over £4 per week. In New York City the average patient cost of voluntary hospitals is about £8 per week, and of municipal about £4 per week. Since the price of essential commodities in the U.S.A. seems to be little higher at present than in Great Britain, the tentative conclusion that the higher maintenance cost is mainly due to better salaries of the staff and better service for patients may perhaps be reasonable.

Recovery of Costs

Few hospitals in the U.S.A. possess large endowments, and the voluntary hospitals therefore depend upon donations and fees recovered for the treatment of patients. They differ from voluntary hospitals in Great Britain in systematically charging patients or their relatives at specified rates, a large proportion of their revenue being derived from this source. At New Haven patients in private rooms pay the full cost—for example, $46 per week—and medical fees in addition; certain other patients of the better class pay $35 per week, ward patients $21, while the charge for cases treated for the municipality is $28. At the Johns Hopkins Hospital, Baltimore, patients' fees range from $105 to $24½ weekly. At the Strong Memorial Hospital, Rochester, private patients pay from $49 to $87½, others $35, with various additional charges for special services. At any of these hospitals fees may be modified as the result of inquiries made by the social service department. Generally, it may be said that voluntary hospitals differ in this respect from private or proprietary institutions only in that the fees, except for private rooms, are insufficient to cover the whole cost of maintenance and treatment.

The practice in governmental hospitals varies. A recent inqury made by the American Hospital Association shows that most of the small local authority hospitals admit an increasing number of paying patients, and that on the average more than 60 per cent. of the gross expenditure is met in this way. On the other hand, the large municipal hospitals of big cities cater almost entirely for the indigent, less than 10 per cent. of their patients paying. In New York City, for instance, where the annual cost of municipal hospitals is about four million pounds, only about 1 per cent. is recovered from patients, and the municipality also pays about one million pounds to voluntary hospitals for the care of the indigent sick.

Group Hospitalization

Under this designation the Americans refer to an organized system of " periodic payment for purchase of hospital care," resembling our contributory schemes. Even before the depression, and to a much greater extent since 1929, voluntary beds have tended to be vacant because patients cannot afford to pay fees, while municipal hospitals have been overcrowded. In Chicago, for example, a 3,000-bed municipal hospital has had an excess of 500 patients. As in the case of New York and Baltimore, one solution is found in payment for recognized patients in voluntary hospitals by the municipality. Great interest is being taken in the alternative of contributory schemes, organized for preference on an areal basis, and intended to be entirely self-supporting from members' subscriptions. They are especially suitable for persons of moderate means who have been accustomed to pay hospital fees, and the contributions are correspondingly larger than ours, running to about £2 yearly (paid in monthly instalments) in New York City, where there are about 60,000 subscribers. Such schemes began to take form about 1930, and there are now more than 300,000 subscribers in different parts of the country. In comparing this figure with our 6½ million participants in workers' contributory schemes, not only the recent date of the inauguration of the American system must be taken into account, but also the somewhat different class and objects it is intended to serve. Schemes are being vigorously promoted and arrangements have been made with more than 300 hospitals. It seems probable that they will play an increasing part in the solution of the financial difficulties of American hospitals.

British Medical Journal

SATURDAY, OCTOBER 17th, 1936

PULMONARY TUBERCULOSIS AND PREGNANCY

In the field of scientific endeavour it is relatively simple to make accurate observations and measurements, but success lies in choosing what measurements to make and in the deductions which are drawn. In medicine there is general agreement on ascertainable facts, and diversity of opinion usually only arises when unknown and therefore unmeasurable factors are concerned. The most glaring exception to this rule is the question whether pregnancy activates a latent or quiescent lesion and/or accelerates progress in active pulmonary tuberculosis. There are some who would unhesitatingly answer both these questions in the affirmative, others who would answer them in the negative, while still others asseverate that pregnancy is actually beneficial to a woman suffering from pulmonary tuberculosis. "Pregnancy is the best cure for consumption," declared Hippocrates: "If a virgin, no marriage; if married, no pregnancy; if pregnant, no confinement; for the mother, no suckling," wrote R. A. Young: and these two dicta, separated by over 2,000 years, represent the extremes of modern opinion.

The reason for this lamentable ignorance concerning easily ascertainable data lies in the one fact that no individual or institution sees a sufficient number of patients over an adequate period to form anything other than an impression. Every obstetrician of wide experience has seen several patients die within two months of delivery from pulmonary tuberculosis, although they manifested neither symptoms nor pyrexia during pregnancy. He has terminated pregnancy in the early months on many occasions without apparently aggravating the disease and with seeming benefit to the patient. He knows that pregnancy associated with tuberculosis of the larynx invariably has a fatal issue, and that tuberculosis of the skin, and in particular lupus, tends to extend during pregnancy. But the obstetrician sees the patient for only a limited period of time and is but rarely acquainted with her subsequent history. Neither does he have the opportunity of assessing the frequency with which pulmonary tuberculosis makes sudden and rapidly fatal strides apart from pregnancy. The tuberculosis expert is, if anything, more severely handicapped, for he knows little about pregnancy and sees so few cases of pulmonary tuberculosis thus complicated.

The complete absence of data on which to form an adequate opinion was authoritatively stressed at a joint meeting of the Sections of Tuberculosis and Obstetrics and Gynaecology at the Annual Meeting held in Oxford. Professor H. Cohen raised the hopes of the meeting by claiming as a physician to "remain the judge in his wider and deeper wisdom of how far general conclusions to which his specialist colleagues have come are applicable to the individual patient under his care." The study of the relevant literature written by his specialist colleagues led him to form the general impression that "questionable tuberculosis" and "definite but inactive" pulmonary tuberculosis are not affected by pregnancy, but that the risks of active pulmonary tuberculosis are thereby increased. Professor James Young, while agreeing that a certain proportion of women with active pulmonary tuberculosis pass through pregnancy and the puerperium with their disease but little affected, nevertheless asserted that "the majority of active cases are adversely affected, and that quiescent and even latent lesions may be stirred into activity." He advocated therapeutic abortion in the early months of pregnancy if the pulmonary lesion was active. His views were strongly supported by Dr. M. H. Logg, who thought that a general deterioration in phthisical patients began after the fifth month of pregnancy. In his judgement the first pregnancy was a risk and the second a disaster. On the other hand, Dr. J. Gravesen from Denmark considered that there were two critical periods in a pregnancy associated with pulmonary tuberculosis, the first occurring during the first two or three months of gestation and the second during and immediately following labour. The widely divergent and remarkably optimistic view expressed by this eminent authority may be due to the fact that his tuberculous patients are confined in the sanatorium, and the meeting was unanimously and strongly of the view that this was the ideal arrangement. Most sanatoria, however, are in the country, where it is impossible to obtain the services of an obstetric specialist, and it may well be that unless a sufficient number of such women are confined annually in the sanatorium the inadequate obstetric service will prove to be a more serious disadvantage to the patient than transference for her confinement to a maternity hospital.

The population of the administrative area of the County of London is about four and a half millions. If the birth rate be taken as 15 per 1,000 and it be assumed that 1 per cent. of all pregnant women suffer from pulmonary tuberculosis, then there ought to be each year in that area some 700 pregnant phthisical women. If that number of women could be confined annually in one adequately staffed obstetric sanatorium the answer to the problem could be obtained in a few years. There are, however, no figures showing the number of pregnant women in London who suffer from pulmonary tuberculosis, and the astonishing thing is that of the 13,000 confinements which take place annually in the maternity wards of the London County Council hospitals only some twenty or thirty are reported as being complicated by phthisis. Until better evidence to the contrary is available, and until we can

organize obstetric sanatoria as in Denmark, the obstetrician is justified in obeying R. A. Young's dictum and in emptying the uterus early in pregnancy if active tuberculosis is present, or has been present during the preceding three years, irrespective of the advice of the tuberculosis expert who may be looking after the patient.

REALITY GIVEN TO A DREAM

At the close of his Presidential Address at the Oxford Meeting of the British Medical Association last July Sir Farquhar Buzzard outlined the idea of a medical school which should be largely devoted to the training of those fitted for a career in clinical research. His words may be quoted: ". . . the necessity of providing at least one school in the country for training men and women the majority of whom would devote their lives to medical research, would not earn their living in practice, and would aspire to the position of director of a research department in a large centre." He coveted for Oxford the distinction of possessing such a school, suggesting that that University offered already the basic requirements as well as the ideal atmosphere in which the work might be pursued ; but he laid down his manuscript with a sigh, describing it as "an ambitious dream." Within three short months that dream is on the way to realization, thanks to a master of industry who sat beside the President in the Sheldonian on that occasion. Lord Nuffield (as will be seen from the scheme set out on another page, where his letter to the Vice-Chancellor is reproduced) has made an offer to the University of Oxford whereby approximately one and a quarter million pounds will be held in trust for the establishment of a medical research school. In the extent of his benefaction, by no means the first he has made to Oxford medicine, Lord Nuffield goes far beyond anything that was possible to the patrons and founders of an earlier day, but while he is able to command great wealth he possesses also, as they did, the gift of vision and understanding.

The scheme, although it owes some of its direction to the ideas put forward at the Annual Meeting of the British Medical Association, is not the result of a sudden impulse on the part of the donor. Seven years ago Lord Nuffield purchased the Radcliffe Observatory and surrounding land, and made a wise and prophetic move by handing it over partly to the University and partly to the Radcliffe Infirmary, the grounds of which it adjoins. Time had to be allowed for the removal of the astronomer tenants, and the Nuffield Institute, now housed at the former observatory, has been at work only for a little more than a year. Its purpose is the promotion of clinical research, especially organized research in therapeutics. Parallel with this development there has taken place a good deal of expansion and improvement of the Radcliffe Infirmary, including the establishment of one of the best maternity homes in the country, also the gift of Lord Nuffield in memory of his mother. The Radcliffe Infirmary, with its Osler Pavilion for tuberculosis, the Oxford Eye Hospital, and the Wingfield-Morris Orthopaedic Hospital (which has also benefited largely from Lord Nuffield's generosity) constitute the hospital unit for a district having a population of a quarter of a million. Thus it is not a question of a small provincial hospital, but of related institutions comprising in all perhaps some 700 or 800 beds. The Oxford hospitals have the material, as they certainly have the spirit, effectively to co-operate in Lord Nuffield's scheme.

The essence of the scheme is the constitution of a school where the professors and their assistants may pursue their research in clinical medicine unhampered by the claims of private practice or the routine teaching of students, while at the same time they may be afforded—what it is so difficult to afford in the same way in the ordinary teaching school—easy access to and collaboration with the scientific departments of the University. In an environment particularly favourable to research, medical men and women, whether Oxford graduates or not, will hold senior University posts, and will have under their direction a body of salaried assistants and house officers specially chosen for their aptitude in the scientific investigation of medical problems. The Oxford Medical School is particularly fortunate in that over a number of recent years its departments—physiology, anatomy, pathology, pharmacology, and biochemistry—have been reorganized, men of outstanding merit have been secured for the chairs, and an admirable team spirit has been evoked.

It is stated clearly in Lord Nuffield's letter to the Vice-Chancellor what kind of organization he has in mind. The University would, in the first instance, establish clinical departments of medicine, surgery, and obstetrics and gynaecology ; also a department of anaesthetics, a subject on which Lord Nuffield is very insistent. Oxford will probably have the first chair of anaesthetics in this country, though there are such chairs in the United States. This branch of medicine has been developing very rapidly, and offers a good field for further research. Each of these clinical departments, and others which may be established from time to time, will be under the direction of a full-time professor in the University, whose assistants will be chosen at first according to the availability of specially qualified persons, though later it should be possible to widen the field of choice so as to bring in workers who had actually been trained in the school itself and had shown a special aptitude for pursuing selected and related paths of inquiry. It will be noted that Lord Nuffield does not exclude the possibility of bringing within the scope of the post-graduate school the clinical training of a limited number of Oxford medical students.

Large benefactions always carry with them the danger that they may result in impoverishment in other directions, and, like the good philanthropist he is, Lord Nuffield has safeguarded these points—for example, by his additional offer of £100,000 in view of the demands which the scheme may make upon the other scientific departments of the University. He is careful also

to point out that the position of the honorary staffs of the hospitals will not be altered, although he does not doubt that the members of these staffs will be willing to accord to the professors such administrative authority over the services of their wards and laboratories as may be necessary for forwarding their own clinical work and co-ordinating the training for clinical assistants and house officers. Indeed, the honorary staffs at Oxford are to be felicitated on the opportunities which the scheme will afford them for keeping in close touch with new developments on the academic side of medicine. They will have access to the latest methods of investigation and treatment as these come to be applied inside the hospitals, also the opportunity of collaborating and consulting with men engaged in the pursuit of the most up-to-date medical inquiries. The hospitals themselves will clearly be benefited by the scheme in respect both of accommodation and equipment; Lord Nuffield says that his scheme must lead to the provision of more ample hospital accommodation in the health centre with which it is associated. Harmonious co-operation between the University and the hospitals seems to be assured through the careful design of a body of trustees, which will include three representatives of the University and three representatives of the governing bodies of the hospitals, with four trustees, including the chairman, nominated by Lord Nuffield himself, the right of nomination on his death to pass to the Chancellor of the University.

We heartily congratulate all concerned at Oxford on a project that would have rejoiced the heart of its long line of scholar-physicians and pious benefactors.

ALCOHOL AND PSYCHIATRY

The seventh Norman Kerr Memorial Lecture was delivered before the Society for the Study of Inebriety on October 13th by Professor D. K. Henderson, physician superintendent of the Royal Edinburgh Hospital for Mental and Nervous Disorders, and an abstract of it appears this week at page 778. At the outset the lecturer pointed out that the distress and disaster following the abuse of alcohol is enormous: its effects reach practically every home, and both directly and indirectly its deleterious results create an individual and racial wastage which has never been adequately assessed. This being the case it would seem reasonable to advocate the total suppression of alcohol, but there is fairly general agreement to-day that such a proposition is not practical or advisable. Alcohol, in some form or other, has come to occupy such an established place in our body economy that it *will* not be done away with. Its position is well reflected by Robert Louis Stevenson's remark to the lady contemplating marriage: that she should marry neither a teetotaler nor a man who did not smoke; life otherwise was apt to become too complicated and quarrelsome. We can, however, plead with every justification for more universal moderation and temperance. Great strides in the right direction have been taken during the past twenty or thirty years: the increase in the price of liquor, the restriction of the hours of sale, and the reduction of the number of licences have all exercised a beneficial influence.

The disastrous clinical effects brought about by the abuse of alcohol were summarized by Forel in the following statement: "Experience shows that in all countries where the alcoholic habit reigns it accounts for from one-half to three-fourths of the crime, a great share of suicides, of mental disorders, of deaths, of diseases generally, of poverty, of vulgar depravity, of sexual excesses, of venereal diseases, and of dissolution of families. In Switzerland careful statistics of the fifteen largest cities show that one-third of the male suicides and one-tenth of the deaths in men above 20 years of age are wholly or essentially referable to alcohol. The worst feature, however, is the effect of the poisoning on the sexual glands of the drunkard, which promotes the production of deformed progeny by direct degeneration of the tissues." This statement, made in 1900, is taken by the Kerr Memorial Lecturer of 1936 as the text for his discussion of the clinical manifestations of the abuse of alcohol.

As regards the treatment of alcoholism, Professor Henderson suggests that there should be drastic changes in the lunacy law. He does not wish to overstress the position or lay down hard-and-fast laws which must hold in every case, but he fails to see why the same or similar medico-psychiatric standards cannot be applied to cases of alcoholism as to other forms of disordered behaviour. Disordered behaviour and unsoundness of mind may not be synonymous terms, but they are so closely associated that in many cases they cannot be separated. There are phases and grades of alcoholism just as there are phases and grades of manic-depressive states, of schizophrenia and paranoid states. In these latter states the condition may be so mild that we are only justified in stating that the patient has a specialized disposition, a constitutional type which may remain entirely quiescent but yet is potentially charged. So it is with alcoholism. In certain families the constitutional predisposition to rely on alcohol is extremely strong, and that predisposition may be exaggerated by faulty training and by actual consumption of liquor. Even under such circumstances many persons may remain more or less immune from untoward effects, but in other cases anti-social conduct occurs which may prove dangerous both to the individual and to society.

This is an important paper, which, when the full text becomes available in printed form, should be widely studied by the medical profession, and any legislation to be fully effective would require the cordial co-operation and support of the public and of the medical and legal professions. We can imagine few readers who will disagree with Professor Henderson when he describes alcoholism as a problem of mental hygiene, or when he says that in any shape or form it is an illness requiring not only skilled treatment, but

also the earnest co-operation of all interested in human betterment. There will be many to share his view that the real point of attack upon the problem is the disposition or personality of the individual who takes alcohol to excess.

A SERIES ON ENDOCRINOLOGY

We print in this issue at page 772 the first article of a series on endocrinology contributed by invitation. Other articles will appear weekly during the next few months. So many problems of the physiology and pathology of the ductless glands are as yet unsolved that such a series might seem to be premature. Many clinical observations yet lack the confirmation of controlled laboratory experiment, and much of the work that is done in the laboratory needs, dare one say, confirmation by the clinician. The high cost of some ductless gland extracts, the difficulty of isolating active principles, and the difficulty, also, of standardizing dosage, all tend to retard progress in a therapeutic field of potentially great value, for in this field the physician should be able to correct physiological disturbances and defects by physiological remedies. The dramatic results obtained in the early days by the administration of thyroid to patients suffering from thyroid deficiency led to extravagant hopes and claims for organotherapy generally, but disillusionment speedily followed. And although in these days optimism is more subdued, the risk of the indiscriminate application of organotherapy still exists. The sales organization of the manufacturing chemist is run on such efficient lines and the number of attractive booklets lauding this and that remedy is so great that the doctor in practice may be led to believe that what is claimed by them is accepted by the expert worker in endocrinology. Ductless gland therapy, to be realistic, must be based upon sound knowledge of the physiology of the endocrine system and of those products which have stood the test of the laboratory and of clinical experience. It is therefore believed that a statement in serial form of modern knowledge on endocrinology will be of help to medical practitioners at the present stage of endocrinological affairs. With this end in view each ductless gland will be considered from two aspects—the scientific and the clinical. It is hoped that the symposium now beginning in these columns will give the reader a clear idea both of ductless gland physiology and of the scope and limitations of ductless gland therapy so far as these are known at the present time.

UPPER DYSPHAGIA

On October 9th Dr. D. R. Paterson of Cardiff delivered the annual address at the Central London Throat, Nose, and Ear Hospital. Dr. Paterson, who is consulting surgeon for diseases of the ear, nose, and throat to the Cardiff Royal Infirmary and a past lecturer in his subject in the Welsh National School of Medicine, was particularly qualified to speak on upper dysphagia because it is well known that he did much of the pioneer work in this subject. He was one of the first to draw attention to a syndrome occurring in middle-aged women, of anaemia and dysphagia associated with changes in the buccal and pharyngeal mucosa, and to point out the significant fact that the subjects of this condition in later life often developed cancer in the region of the site of the oesophageal stricture. The syndrome is not very uncommon. Of sixty-six cases of upper dysphagia which the lecturer had personally observed over one period of his clinical notes, thirty-six were due to malignant disease, the other thirty belonged to the group discussed. Although it is now well known in this country and in America, the syndrome is apparently unrecorded in Italian or French literature, and in France, Germany, and Italy post-cricoid cancer seems to be very rare, but unfortunately this is not the case here or in Holland. The associated anaemia has been studied by Witts and Dan Davies, who found that it is of the achlorhydric variety. The usual method of treating the condition has been by repeated dilatation, but this may produce further irritation and injury to a mucosa which is liable to undergo malignant change. R. D. Owen and Lambert Rogers considered the possibility of relaxing the supra-oesophageal sphincter (crico-pharyngeus), which is the site of the obstruction, and at the same time of increasing the vascularity of the pharyngeal mucous membrane by an attack on the sympathetic innervation of these structures. Finding that the sympathetic fibres to both the sphincter and the mucosa were derived from the superior cervical ganglia, Lambert Rogers now nearly two years ago removed these ganglia for the condition and relief has so far been maintained, this patient being able to swallow normally and having shown considerable improvement in the condition of her mucous membranes and her blood. The cause of the condition is as yet unexplained, and Dr. Paterson suggested that this aspect was still a fascinating problem presenting itself for solution to some of the members of his audience. The address, which was enriched by historical references to the subject of endoscopy as well as to that of upper dysphagia and by personal reminiscences of the lecturer's early work in Vienna and later in Cardiff, was enthusiastically received.

NOISE ABATEMENT

The second annual report of the Anti-Noise League covers the period 1935–6, during which this admirable body has been extremely active. It is fortunate in possessing an indefatigable and influential chairman in Lord Horder, while the council includes three members of the medical profession, besides a potential champion in the House of Commons, Mr. A. P. Herbert. In the opening pages the report refers to the Noise Abatement Exhibition held at the Science Museum last year, which was visited by more than 44,000 people. Exhibits from official and semi-official bodies and from private firms demonstrated practical methods of lessening noise in buildings, in machinery, on the roads, and in the air. A noise map of London was displayed indicating the places where street din is excessive. Following this exhibition inquiries of a technical or semi-technical nature were so numerous that a Technical Advisory Committee was formed, which has produced a series of leaflets on such subjects as: protection of night

workers from noise during the day ; noise and school buildings ; hospitals: planning against noises. In the hope of interesting a wider public in the aims of the league, a quarterly journal entitled *Quiet* was launched this year. The league is represented on the Ministry of Transport's Departmental Committee on Noise in the Operation of Mechanically Propelled Vehicles. In its interim report this committee recommended that new motor vehicles should not be sold if the loudness produced during a normal running test and a running engine test exceeded 90 and 95 phons respectively. (A phon is a measurement of loudness.) For example, average conversation is said to measure 60 phons, the interior of a tube train with windows open 80 to 85, and the neighbourhood of an aeroplane engine 110 to 120. The new model by-law, published in the first annual report of the league, providing for the control of noisy loud speakers and gramophones, has been adopted by nine county councils, fourteen metropolitan boroughs, and sixty-seven other boroughs. Under the London Transport Board noise is being progressively diminished by the substitution of trolley buses for tramways, while the L.M.S. and L.N.E. railway companies have installed platform barrows with rubber tyres, and have made regulations forbidding the unnecessary use of whistles and the excessive blowing off of steam through the safety valves of locomotives. Members of the league have been much in demand as speakers in many parts of the country, and local committees are now in process of formation in various centres. By these and many other methods the league is striving to render the community noise-conscious, and to mobilize public opinion against this menace to nervous stability. The expenses of the league are naturally heavy, and to provide further funds a larger membership is urgently needed. The annual subscription for members is a guinea, for associates five shillings, and applications to join may be sent to the secretary, the Anti-Noise League, 66, Victoria Street, S.W.1.

POISONS RULES: AN EXPLANATORY LEAFLET

The Home Office has issued a memorandum on the provisions of the Pharmacy and Poisons Act, 1933, which is designed to assist medical practitioners and persons in control of hospitals and dispensaries to ascertain the main requirements of the poisons law with which they are specially concerned. There are twenty-three sections to the memorandum, grouped under such headings as: substances subject to restriction ; requirements affecting dispensing practitioners ; how a practitioner may obtain poisons ; prescriptions for fourth schedule poisons ; hospitals ; and supplies and storage within institutions. The report of the Poisons Board was summarized in these columns on June 22nd, 1935 (p. 1269), and the effect of the new rules on general practitioners was discussed on July 6th, 1935 (p. 32). Since then we have referred on several occasions to the implications of the poisons rules in general practice, but in spite of this publicity many practitioners are still in doubt as to the proper procedure under the Act when prescribing and/or dispensing scheduled poisons. All practitioners, but especially those who are in doubt, are advised to get a copy of this memorandum. Its full title is: Memorandum on the Provisions of the Pharmacy and Poisons Act, 1933, affecting Medical, Dental, and Veterinary Practitioners, Hospitals, Dispensaries, and Similar Institutions, and it may be obtained, price 3d., through any bookseller or direct from H.M. Stationery Office, Kingsway, W.C.2.

LORD NUFFIELD'S OFFER TO OXFORD UNIVERSITY

ONE AND A QUARTER MILLIONS FOR MEDICAL RESEARCH SCHOOL

The following letter from Lord Nuffield, dated October 10th, has been received by the Vice-Chancellor of the University of Oxford. The formal acceptance of this magnificent offer rests, of course, with the Congregation ; up to now it has only been before the Hebdomadal Council. In our leader pages we make extended reference to the benefaction and what it augurs for Oxford medicine. The letter reads as follows:

MY DEAR VICE-CHANCELLOR,

The progress of medical science and the conditions under which medical practice is carried on have long been, as you may be aware, among my main interests ; and I have been privileged to be closely associated with the development of more than one hospital and to have had many opportunities of discussing problems of medical research and practice with prominent members of the profession.

I realize that progress in medical science is reaching a stage where it is desirable for those who work in the field of research to undergo a period of post-graduate training in modern methods of investigation, to keep in close touch with developments in the sciences ancillary to medicine, and to pursue their inquiries unhampered by the cares of private practice and of routine teaching.

In regard to medical practice, I welcome the increasing tendency to regard all health services, preservative, preventive, and curative, not as separate entities but as constituent parts of a combined effort to promote and maintain the good health of the community. It is specially gratifying to me to learn that attempts to give effect to this ideal are being made in Oxford.

Thence it is an easy step to the conception that the presence of a post-graduate medical school in a University town in which all the scientific departments are within easy reach of the hospitals and in which co-ordination of health services will, I hope, be soon established, would improve the position and the facilities of those already engaged in clinical work in either institutional or general practice.

Sir Farquhar Buzzard, in his presidential address to the British Medical Association on July 21st, put into words what had been going through my mind when he spoke of an " ambitious dream " of developing such a medical school in Oxford and thus filling the one conspicuous gap in the system of medical services which he foresaw. It would be a great pleasure to me to help in giving reality to this dream in a city where there are already hospitals with which I have the satisfaction of being closely associated, and in a University of which I am proud to be an honorary graduate, and where, though on a small scale, there is already an Institute of Medical Research.

Training in Methods of Research

The basis of my proposal is that the University, offering as it does an environment more favourable to research than in a big training hospital, should widen the scope of its Medical School and of the Nuffield Institute for Medical Research for the purpose I have already indicated. This would involve the establishment of senior posts to be held by men or women not subject

to the distractions of private practice, under whose direction there would be a body of salaried clinical assistants and house officers selected for their promise of aptitude for the scientific investigation, under institutional conditions, of medical problems. These posts would be open to any qualified practitioner, whether a graduate of the University of Oxford or not, and they would also clearly give facilities to those of them who are desirous of proceeding to higher degrees.

I do not exclude the possibility or the desirability, when this post-graduate school has been established, of including within its scope the clinical training of a limited number of Oxford medical students: this would be an extension of the clinical training already undertaken by the honorary staff of the Radcliffe Infirmary.

While it is my primary object to promote the progress of medical knowledge, I should not, at a time when there is so much suffering for which relief cannot be obtained through mere lack of accommodation, be willing to concentrate such help as I can give on that object were I not satisfied that my scheme must inevitably increase and facilitate the clinical investigation and treatment of patients and lead to the provision of more ample hospital accommodation in the health centre with which it is associated. For this reason I am confident that the University will be able to secure the ready co-operation of the hospitals in the neighbourhood, without which the fulfilment of the scheme would be impossible.

It is not for me to prescribe the details of a scheme which, however it may be formulated at the start, I realize must be capable of modification from time to time in the light of experience. But having said so much in regard to the fundamental conditions of my offer, I will endeavour to outline the sort of organization which seems to me likely to be effective.

Clinical Departments to be Established

The University would as a development of its medical school in the first instance establish clinical departments of medicine, of surgery, and of obstetrics combined with gynaecology—the three principal branches of clinical medicine generally recognized by the medical profession—a department of anaesthetics, and such other departments as from time to time may seem desirable. Each of these clinical departments would be under the direction of a professor in the University, whose assistants at the early stage would be chosen according to the availability at the time of specially qualified men and women, though later the field of choice would be widened by workers whose training in the school and in the departments of the ancillary sciences would specially qualify them to pursue selected and related paths of inquiry in it. The professors would naturally look to the honorary staff of the hospitals for their co-operation in giving them access to beds and the use of relative hospital services in the hospitals associated with the scheme. It would, from their respective points of view, be to the interest of the school and of the hospitals equally that the facilities already provided for the institutional treatment of the sick should be progressively improved. It would be understood that contributions could be made from the fund which I propose to create to any special expenses attendant upon the development of the school which the hospitals were required to incur. The position of the honorary staffs of the hospitals would not be altered, although the members would, I have no doubt, be quite willing to entrust to the professors such administrative authority over the services of their wards and laboratories as would be necessary for facilitating their own clinical work and for co-ordinating the training of clinical assistants and house officers.

In order to avoid the diversion of energy from research which the claims of private practice would involve (no man specially qualified to relieve suffering can be expected to refuse to relieve it if he has only his own inclinations to study), it seems advisable that the professors should be full-time University officers. But in medicine the enhancement of knowledge and the treatment of the sick must go hand in hand, and it would be reasonable, therefore, to permit them to augment the clinical material available for them by admitting to pay-beds in the hospital a limited number of patients who can afford to pay fees for medical or surgical treatment.

Creation of a Trust

To promote a scheme on the lines laid down and illustrated respectively above, I am willing to give to the University in trust sums which will amount, in the aggregate, to approximately one and a quarter million pounds. It is an absolute condition of this offer

(i) that a body of trustees be appointed, whose duties shall be
(*a*) to receive annual accounts of the income received by the trust fund and expenditure defrayed from it, together with an annual report on the work of the school, and to report to the University upon such accounts and report;
(*b*) to receive annual estimates of income and expenditure, and to determine whether developments proposed to be financed out of the fund are consistent with the terms of the trust;

(ii) that whatever body is entrusted by the University with the execution of the scheme should include persons representing the hospitals associated with the scheme, in such proportion as will, so far as human fallibility will permit, secure harmonious co-operation.

I should wish to have the right during my lifetime to nominate a trustee who will be the chairman of the trustees and also three other trustees, and on my death this right of nomination to pass to the Chancellor of the University. I should further wish the Vice-Chancellor to be a trustee *ex officio*, and the University to appoint two other trustees, and the governing bodies of the Radcliffe Infirmary and of the Wingfield-Morris Orthopaedic Hospital (the two Oxford hospitals with which I am closely associated) to appoint two trustees and one respectively.

An appropriate Deed of Covenant and Trust would be drawn up to give effect to this offer, and such Deeds would provide that the power of investment as to any moneys which may be invested under the trust is not to be limited to trustee securities as defined by the Trustee Act, 1925, but it is to include all securities in which the University is empowered by its own statutes to invest its funds.

Realizing that this scheme will make demands upon the other scientific departments of the University. I am prepared also to contribute the sum of £100,000 to the appeal which I understand the University will be making shortly, and of which the object is to secure that the University shall not be prevented by straitened finances from providing essential services.

Yours sincerely,

NUFFIELD.

In explanation of the last paragraph of Lord Nuffield's letter it may be said that the University is about to make an appeal, having in view the cost of the new Bodleian library and the general state of the University finances. This postscript is characteristic of Lord Nuffield's thoughtfulness lest a benefaction in one direction should cause any ill in others.

The Congress Committee of the British Institute of Radiology has decided that on the occasion of the Congress at the Central Hall, Westminster, on December 2nd, 3rd, and 4th, the usual medical papers shall be replaced by a medical exhibit and symposium of papers on the same subject. The subjects chosen are: bone tumours and their differential diagnosis, and anatomical variations of the gastro-intestinal tract. The opening paper of the session on bone tumours will be read by Dr. J. F. Brailsford, and that of the session on the gastro-intestinal tract by Sir Thomas Dunhill. Sir E. Farquhar Buzzard will open the Congress and Exhibition of Radiology on Wednesday, December 2nd. Dr. Arthur C. Christie will deliver the nineteenth Silvanus Thompson Memorial Lecture, and Dr. J. Cockcroft the seventeenth Mackenzie Davidson Memorial Lecture.

THE ENDOCRINES IN THEORY AND PRACTICE

This article is the first of a series on Endocrinology contributed by invitation

THE PRESENT POSITION OF ENDOCRINOLOGY

BY

SIR WALTER LANGDON-BROWN, M.D., F.R.C.P.

In a subject of such rapid growth as endocrinology the practitioner may well feel lost among what appears to be a maze of disconnected facts. It is therefore with a feeling of relief that we can see a plan beginning to emerge which may in some measure act as a guide.

The first phase of our knowledge of endocrines led to a conception of an autonomous system acting independently of the central nervous system. *A priori* this might have been realized as unlikely, considering that complexity of structure demands some central control. The newer conception places the controlling centre in the diencephalon, which is closely linked up with the expression of the emotions. The diencephalon has ties in three directions: with the cortex of the brain above; with the pituitary below; and with the sympathetic nervous system, of which it appears to be the head ganglion. In this way a psychical experience may record its effects either through the chemical mechanisms initiated through the pituitary, or through the sympathetic acting on the viscera or on other ductless glands.

Integration of the Endocrine System

The first hint as to the method of integration of the endocrine system came from Langley's generalization that the effect of adrenaline on any part was the same as stimulation of the sympathetic nerves to that part. Indeed, the cells of the adrenal medulla actually replace a part of the sympathetic nervous system. But the significance of this substitution of a chemical for a nervous mechanism was missed for a time. That emotion could influence secretion had long been recognized; the tears of sorrow, the dry mouth of fear, the polyuria of nervousness, were proverbial. What was not recognized was that these were merely special instances of a general law, that the messages transmitted by the nerves are ultimately translated by chemical messengers. And that phrase—chemical messengers—at once recalls that this was the very description which Starling gave to hormones when he originally introduced the term. It adds point to that description to find that one particular hormone—adrenaline (or, as Cannon holds, a closely similar chemical substance)—is liberated at the final ending of every sympathetic nerve when stimulated, while Dale showed that acetylcholine is similarly liberated at parasympathetic endings. Hormones, then, are highly specialized instances of chemical messengers which are by no means outside nervous control.

In addition to this method of direct control there is an indirect control through the anterior pituitary, which has gradually come to be recognized as the leader of the endocrine orchestra, as I ventured to describe it. The way in which it exerts its influence on the others has been made more intelligible by Dodds, who classifies hormones under two headings. The first are complex protein bodies formed by the anterior pituitary, which act on the other endocrine glands, causing them to form the secondary type of hormones: these are bodies of comparatively small molecular weight, and most of them have been isolated in crystalline form, some having actually been prepared synthetically. In this respect the posterior pituitary belongs to the second group.

Type of Cell in the Pituitary

In this task the anterior pituitary has been credited with the production of an inordinate number of hormones, but now there is a reaction against this view. It appears more probable that its task is to produce an accelerating and an inhibitory substance which can stimulate or diminish the activity of other glands in accordance with the needs of the body. On that view these two substances would correspond to Sharpey-Schafer's original distinction between a hormone and a chalone respectively. The three types of cell to be found in the anterior pituitary were allotted their appropriate functions: the chromophobe cell, the undifferentiated parent cell which gave rise both to the eosinophil or growth cell, and the basophil or sex cell. But further observation and reflection has thrown doubt on this simple distinction, and it has been suggested that the eosinophil cell produces the accelerator hormone and the basophil cell the inhibitor. Cushing's description of the syndrome known by his name has aroused much discussion, and we must not anticipate what is to be said on this subject in another article. Suffice it to say here that while this syndrome may apparently be initiated by changes in the pituitary, thymus, adrenals, or ovary alike, Crooke's generalization appears to be confirmed—that the only factor common to these various manifestations of the syndrome is a hyaline change in those basophil cells which does not appear to be degenerative, but probably an expression of altered physiological activity. He regards this change as of fundamental importance.

The Endocrines and Sex

This naturally leads to the consideration of the influence of the endocrines on sex. That the anterior pituitary produces something which is necessary to sexual maturation is generally accepted, and the cells producing it appear to increase for a time in number when sexual activity is reduced by operative intervention or by the menopause, as if to stimulate a system that is flagging. The ovary and anterior pituitary are complementary; too much oestrin depresses pituitary activity, and too little makes it unusually apparent. The influence of the anterior pituitary-like substance extracted from pregnancy urine in helping sexual maturation is strikingly seen in the successful treatment of many cases of undescended testis. At first sight it seems extraordinary that a female hormone should have a masculinizing effect. McLellan has recently made an interesting suggestion based on the complementary actions referred to above. He thinks that the boys who respond to this treatment may, during intrauterine life, have been subjected to an excessive amount of oestrin or to a deficient amount of anterior pituitary substance. In that case the anterior pituitary-like substance obtained from pregnancy urine simply rectifies at a late stage the hormonic balance. There is, however, another possibility. The male and female hormones are closely related chemically, and, as we shall see later, there is a considerable amount of overlap between the effects produced by a number of such substances; in other words, they do not appear to be strictly specific.

Perhaps the clearest indication of the way in which endocrines can influence sex is to be gained from a consideration of certain ovarian tumours—the arrhenoblastomas which occasionally occur in the rete of the ovary and simulate seminiferous tubules. It therefore appears that the ovary is a bisexual organ. Virilism in women can be produced by: (*a*) a direct overgrowth of the masculine rudiments in the medulla of the ovary; (*b*) by an overgrowth of cells of similar origin in the adrenal cortex; or (*c*) anterior pituitary disorders which disturb the balance between the female cortex and the male medulla of the ovary. That a thymic growth disturbs this balance in the same direction is known, but how disease of this infantile gland effects this is at present quite obscure.

Specificity of Hormones

We must next consider two new aspects of endocrinology: the degree to which hormones are specific, and the competence of the tissues to respond to their stimulation. As to the former, E. C. Dodds has shown that simpler compounds than those prepared by the body can have the same biological effect to a less or even greater extent. The basal group with the simplest chemical structure that can produce the biological effect he calls the "skeleton key," which picks the physiological lock. He also showed that the same basal group could produce more than one biological effect, and to such groups he gave the name of "pass keys."

Following this line of thought, more particularly with regard to stimulants of growth, we may adopt Needham's classification of substances affecting normal and pathological growth. He differentiates them into those which act by providing for optimum nutrition, and those which act by specific stimulus, whether hormones (both glandular and non-glandular), vitamins, or drug-like substances. The best examples of non-glandular hormones are to be found in the "organizers" of the embryo, which are not cellular structures but chemical substances. They are not ferments, for boiling actually liberates them in an active condition in parts of an egg, where they never normally so appear. The best known of these is the one which organizes the first appearance of a central nervous system in the embryo. This is a sterol closely related chemically to oestrogenic compounds, which in their turn are chemically related to carcinogenetic substances on the one hand, and to bile acids and vitamin D on the other. This chemical relationship between various stimulants to normal growth and those to abnormal growth is both interesting and important. That there is also a functional relationship was clearly brought out by Dr. Needham in his paper read at the Oxford meeting of the British Medical Association. Let us consider some illustrative instances.

Relation of Hormones to Vitamins and other Substances

We know that parathormone and vitamin D each control calcium metabolism, though in a different way. Again, vitamin A is as necessary for the growth of the hind legs of an embryo pig as thyroxine is for the development of the tadpole's limbs. The old distinction between endogenous hormones and exogenous vitamins loses its validity now we know that the animal body forms vitamin A from carotene, that the embryo chick can synthesize its own vitamin C, and that irradiation of the skin will lead to the production of vitamin D. Oestrogens, moreover, are found in plants, and human oestrin can cause daffodils to flower all the year round.

Lack of vitamin A causes xerophthalmia and a defect in the visual purple. But if a sow be deprived of this vitamin her litter suffer a much graver ocular damage—the eye cup and lens fail to form at all. Now the normal stimulus to the formation of the lens resides in an "organizer" found in the eye cup. Moreover, even synthetic oestrogenic hydrocarbons have actually been shown to act as organizers of the nervous system in the embryo.

Carcinogens can excite oestrus and oestrin can have carcinogenetic effects. Human skin heated to a very high temperature will yield a tarry substance which is as carcinogenetic as any derived from coal tar. A strongly carcinogenetic substance has also been synthesized by Cook from deoxycholic acid, a sterol in bile. Therein is a hint at the explanation of the known close association between gall-stones and cancer. Again, if fertilization is delayed in amphibia the organizer may escape from its proper site and set up teratomata capable of wide metastasis. This throws new light on the origin of these so-called "included twins." In this connexion the role of vitamin E in reproduction is instructive. In its absence the embryo throws out a rapidly proliferating "lethal ring" of new growth, thus committing suicide by cutting itself off from its own food supply. Here the vitamin appears to impose order on what would otherwise be a disorderly growth, just as vitamin D controls irregular ossification.

Physical Chemistry of the Cell

From this collection of amazing facts two definite conclusions emerge: (1) the overlap between the activities of these various stimulants to growth is very considerable; (2) from sterols normally occurring in the body a deranged metabolism may produce specific carcinogenetic substances which will stimulate certain cells to wild proliferation. Mark that phrase, "certain cells," for now we pass to an aspect of hormonic action which is only just becoming recognized—that there are two distinct factors concerned, not only the power of the hormone to excite, but the competence of the tissue to respond. True, it is a good many years since Sir Arthur Keith, musing over a specimen showing hypertrophy of one side of the face in a case of hyperpituitarism, pointed out, with his subtle intuition, that there must be some local receptive agent to respond thus partially to a generally distributed excess of hormone. To-day we have some precise facts which confirm that intuition.

Thyroxine is known to promote metamorphosis in the tadpole. In doing so it will simultaneously excite proliferation of the limbs and degeneration of the gills in immediately adjacent areas. Histologically the division between these two is quite clear-cut; rapidly dividing cells are seen in one area, and degenerating cells in the other. Such a state of affairs postulates an entirely different capacity for response in each. Embryologists speak of this as the "competence" of the tissue to react. This competence clearly varies as life goes on, and hence the different response to hormones at different epochs. Indeed, it has been shown that at the menopause the altered response of the reproductive organs plays quite as large a part as the failure of hormonic stimulus. The onset of senility may well be determined by such factors. Competence may be altered by drugs. Thus Zondek maintained that barbitones impede the entrance of thyroxine into the cell, thus providing scientific sanction for the increasing empirical use of such drugs in hyperthyroidism. Indeed, a new pharmacology is springing up, based on a study of these receptive mechanisms. The barrier which atropine offers to the acetylcholine liberated by vagal stimulation, and the reinforcement that physostigmine and its derivatives provide it with, are familiar examples. In the same way ergotoxine bars the entrance of adrenaline into the cell.

Here we are on the threshold of the physical chemistry of the cell, where at present only the biochemical expert

can enter. He hints darkly at surface tensions and ionic equilibrium, and there the practising physician must leave him, in full expectation of more results in the near future. Nor does Collip's conception of anti-hormones help us much yet, though it may clarify our ideas before long.

Conclusion

Amid all these rapidly accumulating facts and changing theories it is not surprising that organotherapy lags behind endocrinology. Clearly some of the extravagant hopes indulged in are not going to be realized as yet, if ever. Indiscriminate prescription of endocrine products, without reference to the possibility of their physiological or pharmacological activity, merely impedes progress and brings discredit on an important subject. It would be well for the practitioner to familiarize himself with doses in terms of international units where these have been determined, and it is one of the aims of the present series of articles to provide him with such information as will help him to realize the scope and limitation of endocrine therapy. As a preliminary to such information, it may be well to sum up the present position of endocrinology in a few dogmatically stated conclusions.

1. Hormones are a special instance of metabolic energizers which are widely spread throughout the body and which may give rise to either physiological or pathological effects.

2. They are of two grades: the first, of complex chemistry, are formed by the anterior pituitary, which uses them to stimulate or inhibit the secretion of the second, chemically simpler, grade by the other endocrine glands.

3. They are not entirely specific; the same basal chemical group can act as a "pass key," producing more than one biological effect.

4. To a large extent they have come under the control of the diencephalo-pituitary apparatus.

5. Their activity is largely conditioned by the competence of the tissues to respond to them.

THE FUTURE OF THE INTERNATIONAL HEALTH ORGANIZATION

[By Our Geneva Correspondent]

The devaluation of the Swiss franc will not adversely affect the financial resources of the League of Nations, whose budget has always been calculated in gold francs and whose investments are spread over many countries. This is fortunate for the Health Organization of the League, because next year the Rockefeller benefaction comes to an end. The grant of 300,000 Swiss gold francs annually was made in 1922 for a period of fifteen years, and is mainly spent in salaries of technical staff. It is already agitating the Health Organization and the Finance Committee of the Assembly as to how the work will be financed when this subsidy is withdrawn. The director of the Health Section has asked that the staff whose salaries are now paid out of the Rockefeller grant be placed on the League pay-roll. This matter will be decided next year, when the budget for 1938 comes up for discussion. No doubt the valuable services of the Health Organization, which everyone acclaims, will be the factor determining the decision. There is a proposal to standardize the amount which the League spends on health work at one million Swiss francs (some £50,000) instead of at 875,000 francs as at present, and it is said that at this figure it would be possible to continue the work unimpaired despite the withdrawal of the Rockefeller gift.

Work on Nutrition

The work on nutrition is still the subject of rather desultory debates, in which information is exchanged but nothing in particular done. Mr. Geoffrey Shakespeare said the British Government endorsed the recommendations of Lord Astor's committee, the report of which was "un succès de librairie" in the United Kingdom. He described the steps taken to provide milk for school children, and said that the Government was considering the possibility of extending cheap milk schemes. A committee under the chairmanship of Lord De La Warr was being set up to co-ordinate information on nutrition in the British colonies. The Dutch delegate gave a rosy account of nutrition and public health in the Netherlands. The general death rate, the infant mortality rate, and the tuberculosis rate were all declining. The Norwegian delegate said that thanks to a Rockefeller donation an institute of public health had been established as part of the University of Oslo. A national health insurance scheme was about to be introduced into Norway. The Latvian delegate spoke of the organization in his country under official auspices of workers' refectories and public kitchens, all in accordance with the latest dietetic principles. Elaborate systems of milk production and control have also been set up in that country. A reminder of the economic side of the question came from the New Zealand delegate, Sir James Parr, in a reference to the high cost of transport, whereby apples which the New Zealand farmer sells at less than one penny a pound are retailed in Europe at eightpence or tenpence a pound.

Abuse of Narcotic Drugs

The debate on dangerous drugs was noteworthy for a speech by the Portuguese delegate, who calculated that the legitimate world requirements of narcotic drugs could be estimated at about 540 tons, and that world production in 1934, without taking account of the Chinese output of raw opium, was twice as great as world requirements. A distinction was drawn by one of the South American delegates between the chewing of coca leaf—which was a common practice in several South American countries—and the "drug addiction of the idle." He said that such chewing in moderation helped the natives in their work, especially in enduring forced marches and high altitudes. The Indian delegate, Sir Krishnama Chari, said that in 1935 exports of opium from India, other than for medical or scientific purposes, had ceased. This had not been done without financial sacrifices. The revenue from opium exports, which twenty-five years ago was over seven million pounds, had now entirely disappeared. The Canadian delegate complained of an extensive traffic in cocaine from Japan through Canada. Japan had declared that she was taking very strong measures, and her assurances on the subject were welcomed by the Canadian Government. Finally, the British delegate said that his Government would do all it could to assist China in her efforts to combat the opium evil, and was now applying to British subjects enjoying extraterritorial rights in China the penalties applicable in the United Kingdom.

According to S. Muntner (*Wien. klin. Woch.*, July 3rd, 1936, p. 850) treatment of post-encephalitic Parkinsonism by scopolamine is to be deprecated as having only a narcotic action and diminishing the excitability of those central nerve fibres to the exclusion of whose activity a portion of the syndrome is due. Further experience has confirmed the value of treatment by large doses of atropine, the toxic symptoms of which are neutralized by simultaneous administration of pilocarpine or physostigmine. The atropine dosage is increased to five drops of a 0.5 per cent. solution twice daily orally, with a pill containing 0.01 gram of pilocarpine twice daily. On two days weekly the morning and afternoon doses of atropine are replaced by a subcutaneous injection of 0.002 to 0.0025 gram. Medical exercises used at the same time include dancing or rhythmic upper limb responses to dance or march music from the gramophone. In refractory cases novatropine (homatropine methyl bromide) may be given in about one-third of the amounts prescribed for atropine. Phenyl-ethyl-barbituric acid in doses of 0.05 gram is a useful adjuvant.

OPENING OF NEW SESSION

GUY'S HOSPITAL

LORD DAWSON ON "THE DOCTOR'S HORIZON"

The annual prize distribution at Guy's Hospital Medical and Dental Schools took place on October 12th, under the chairmanship of Lord NUFFIELD, treasurer of the hospital. Viscount DAWSON OF PENN distributed the prizes and delivered an address inaugurating the winter session.

Lord Dawson began by commenting on the fact that his visit coincided with the inauguration of Guy's appeal for the continuance of the work of the hospital. The claim of this great teaching hospital upon the generosity of the public was insistent. He reminded his hearers of its great traditions. Names like Bright, Addison, Astley Cooper, and Hodgkin inspired the students who now worked within its walls. In these latter days it had supplied a regius professor at Cambridge, its senior physician was the chosen Harveian Orator for 1937, and it had given Bart's a professor of medicine.

Physical Education and Recreation

There was no profession which took so great a toll of the attributes of man as did medicine. Body, mind, and spirit were often in full exercise simultaneously. The body of the doctor needed to be strong, resilient, able to endure. His mind had to be quick and resourceful, and he needed to be confident and cheerful under stress. The medical student himself should stand forth as an example of what the body ought to be. The speaker was among those who would have physical recreation regarded by students as a part of their education. The physique of the nation was now becoming a subject of wide concern. Public opinion was beginning to realize that systematic cultivation of the body needed as much care as the cultivation of the mind, and should be as much a matter of national concern. Physical education and recreation, though the former belonged to school hours and the latter to leisure, were complementary; though distinct from each other in purpose, they overlapped. It was as well to remember that proficiency in games could go hand in hand with considerable physical defects, which might be remedied by proper attention to physical education. Personal benefits apart, students would learn by the avenue of experience the study of movement and poise and the basis of treatment by physical exercise and by manipulation—branches of therapeutics sadly in need of intelligent development.

The Training of the Mind

Turning to the education of the mind, Lord Dawson said that now, more perhaps than ever before, a sound knowledge of biology, physics, and chemistry was an essential foundation. He mentioned some of the profound discoveries in these realms of recent years, and added that he did not think it was too much to say that those he was addressing would see the molecular structure of protein unfolded, and perhaps its synthesis, and as man had to get his nitrogen from protein, he would then be able to get his protein from Imperial Chemical Industries! The beneficent ascendancy of the palate, however, would probably still hold sway.

The curriculum was admittedly overburdened, and would need to be rationed on some better plan if students were not to suffer from mental dyspepsia. In the past anatomy had been a good example of the evil of mere memorization. This teaching had now been made more selective, and with the aid of radiography and illustrations from orthopaedic surgery was every year becoming more alive. When one was young it was often more easy to remember than to think, and among the many dangers attaching to modern life was the danger that owing to the extraordinary means for the diffusion of information a race of mere impressionists might arise. That would not do for medicine, at least for the thinking doctor. He would rather see a man arrive at a wrong diagnosis by good reasoning than at a right diagnosis after reasoning that was unsound. To do the first was to exhibit only an immature judgement; the second, an ill-trained mind.

In sickness it was natural for every man to claim his right to be ill in his own way. Here man's fundamental individualism was unfolded. When the student began his work in the wards he really entered a new world, coming up against personality with its infinite variations. Illness was less standardized than it used to be. Processes of disease were less violent and more slow in operation, unlike the plague of old, which came quickly and reduced humanity to a common denominator. Owing to the very complexity of modern life the personal equation or the reaction of the individual stood for more, not for less. It might safely be said that in comprehensive diagnosis often lay the best treatment.

Learning and Teaching

The doctor was concerned on the one hand with knowledge and on the other with its application. Though he could not cure all diseases there was never an occasion when he could not bring help and solace. Lord Dawson stressed the value of medical societies and journals as instruments of progress in the profession; there new ideas were brought to light, and the habit of the receptive mind was learned. The doctor was a student until his death, or, put differently, when he ceased to be a student he died. Nothing had widened the horizon more than the development of preventive medicine. Doctors were thinking more and more of constructive health; they were more and more concerned with people who were up and doing—children in schools, operatives in factories. More and more the doctor might be expected to have a teaching function.

"In conclusion, I address myself to the young members of my profession. You have chosen a great work. It is hard, it calls for discipline and a readiness to spurn delights; but as a compensation you are in the ranks of advancing knowledge, and you will live more fully as the years go on. To you will belong the larger vision, and with it increasing love and tolerance of your brother men. Be thinkers and doers, keep wide your interests, preserve your freedom, tread your path with confident and joyful step, and God speed your venture!"

A vote of thanks to Lord Dawson was enthusiastically accorded on the motion of the dean, Professor T. B. JOHNSON, and a similar vote to Lord Nuffield, proposed by Dr. A. F. HURST.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL

DR. BEATTIE ON "THE EXPERIMENTAL METHOD"

At the opening of the session of King's College Hospital Medical School on October 5th an address was given by Dr. JOHN BEATTIE, conservator of the Museum and director of research, Royal College of Surgeons of England, who took as his "text" the recent controversy in the *Nineteenth Century and After* and other periodicals on the separation of university teaching from research and the formation within university staffs of two distinct groups, one devoting its energies to research and the other to teaching.

Clinical Observation

Dr. Beattie said that there was a strange tradition that on passing from the pre-clinical to the clinical curriculum the realm of true science was left behind, and scientific methods no longer applied. There would always be an art in medicine, but there would also be a science, as yet incomplete and imperfect. There were strong arguments for the systematic and continued application of scientific methods in the study of disease. Whenever these had been properly applied the results had been outstanding. The neurological work of Horsley, Risien Russell, Head, and Kinnier Wilson, the cardiovascular investigations of Mackenzie, Keith, Flack, and Lewis, all began with the observation of patients suffering from disease. In surgery the same sequence of events had taken place. Most of the outstanding investigators in the field of clinical medicine and surgery were equally good bedside teachers. There seemed to be good reason to combine in the clinical teacher the qualities of the teacher and the investigator. The British tradition of medical education enshrined the old but ever new method of

teaching—bedside instruction. The patient was the central problem, not the disease or disability from which he suffered. If this clinical method was to be retained in the educational system it was necessary to make sure that those who used it should be trained to explore its possibilities to the full. "Accurate observation, clear thinking, and adequate knowledge, not only of facts but of methods, are certainly essential. Couple these with a sympathetic understanding of the patient's point of view and we have in brief what Osler regarded as the complete clinician."

The clinical teacher, in addition to observation and logical deduction, must also have knowledge, by which was meant not only actual data but an acquaintance with methods and the value of data obtained by such methods. Dr. Beattie could not agree with Dr. R. Coulborn when he wrote in the *Nineteenth Century and After* that methods of research, at least in so far as they affected medicine, had "a numbing influence on character"; rather would he agree with Professor R. A. Peters when he pointed out in *Nature* that "if it be numbing to teach proper humility and the scope of his actual knowledge, let us have more of such refrigeration."

Research Work in Surgery

The Medical Research Council had wisely decided to play its part in encouraging young clinicians to engage in experimental research on clinical problems. This policy would do much to develop in the medical schools the type of teacher who could stimulate students not only to study but to think. Already there were signs that in one branch of medicine the usefulness of the clinician trained partly in a research laboratory was being recognized. Six years ago, when the Council of the Royal College of Surgeons determined to provide facilities for research in Lincoln's Inn Fields, the experiment was regarded by many as an unjustifiable waste of money; because it was believed that surgical research could only be done in the operating theatre and hospital ward. But gradually it was shown that there were surgical problems capable of solution in the experimental laboratory. The Buckston Browne farm had been provided, and new laboratories would soon rise in Lincoln's Inn Fields. But as this expansion went on the policy behind it had changed even more rapidly. "The aim is now not just to provide laboratories but to develop an English school of experimental research, training young men to go out into the teaching hospitals with a record of work well done, a knowledge of and respect for what their co-workers are doing, and 'the divine spark of discontent' well alight within them."

The happy combination of the prestige and traditions of the Royal College of Surgeons and its Museum with a vigorous school passing through its laboratories a dozen or more men a year was a symbol of the rejuvenescence of British surgery, which for too long had sought its inspiration in other lands. One looked forward not only to the production of first-class research work in these laboratories, but even more to the influence which men who had passed through them would exert on the medical students they taught.

All the research facilities which could be provided, Dr. Beattie concluded, would in the end produce little effective result if young men were forced to leave the happy and congenial combination of clinical teaching and research at their most productive period owing to the fact that there were no posts which would guarantee for them at least a reasonable salary. The remedy was the creation of full-time registrars and tutors engaged partly in teaching and hospital practice and with ample time for research. Full use could then be made by the teaching hospitals of the men who had held Medical Research Council and other research fellowships in clinical science. It was time to make a start, and in that hospital, which befriended Lister and his ideals, he thought it might be possible to create, say, one full-time post in each of the medical and surgical departments. The occupant of such a post would be required to spend half his time in the investigation of some clinical problem amenable to experimental investigation. Assuming that the right men were chosen, he could see no more profitable investment.

DEFENCE AGAINST POISON GAS

MEDICAL INSTRUCTION

The Air Raid Precautions Department of the Home Office, 5, Princes Street, Westminster, S.W.1, has issued the following notice for publication.

Measures designed for the protection of the civil population of this country against gas form an important part of the general precautions against air attack being prepared by the Air Raid Precautions Department of the Home Office.

From the point of view of the general public it is obviously of the greatest importance that the medical profession of the country should have a sound knowledge of the appropriate methods of treatment and protection against gas. It is, furthermore, a subject with which the medical profession does not come into close contact in time of peace in the course of its normal duties.

Conferences have been held with the deans of the medical schools, the British Medical Association, and the College of Nursing at which the measures which might be taken to provide facilities for the medical profession to acquire a knowledge of anti-gas precautions were fully discussed. The authorities concerned have all been good enough to promise their co-operation and the assistance of their machinery in carrying out this work; and general agreement was reached on the methods outlined below, by which it is hoped to achieve the desired results.

The Air Raid Precautions Department has now engaged the services of ten specially selected medical men, who will be available to assist the medical profession as a whole. Arrangements have been made for the selected doctors to be specially trained at the Home Office Civilian Anti-Gas School, and they are now ready to take up their duties. It is proposed that their services should be available to all branches of the medical profession, including the practising doctor, the medical student, and the nurse. Their work will be carried on under the auspices and with the assistance of the British Medical Association, the deans of the medical schools, the College of Nursing, and the various hospital authorities throughout the country. They will be stationed in London, Salisbury, Birmingham, Cambridge, Newcastle-on-Tyne, Leeds, Liverpool, Edinburgh, and Glasgow.

The technical equipment necessary for the proper provision of practical instruction is being provided by the Government, and the services of the selected doctors will be available free.

It is realized that professional people such as doctors and nurses are very fully occupied, and the times of the classes will therefore be carefully arranged, so far as is possible, to meet the convenience of all concerned. It is hoped that the medical profession will avail themselves of the opportunity provided of acquiring this knowledge which might be essential to them in time of emergency.

The names and addresses of the instructors and the centres from which they will operate are given below.

Medical Instructors and Centres

London: Colonel G. S. Wallace, Belgrave House, Palace Road, East Molesey, Surrey.
London: Dr. L. Haden Guest, 3, Token House Buildings, Kings Arms Yard, Moorgate, E.C.2.
Cambridge: Major-General H. P. W. Barrow, Lion Hotel, Cambridge.
Salisbury: Dr. E. M. Pearse, 82, Westbourne Terrace, London, W.2.
Liverpool: Dr. L. T. Challenor, 35, Beresford Road, Oxton, Birkenhead.
Leeds: Dr. K. H. Beverley, The Haven, Worksborough Dale, Barnsley, Yorkshire.
Birmingham: Surgeon Captain P. F. Woodruff-Minett, R.N., Imperial Hotel, Birmingham.
Newcastle: Dr. K. S. Dickinson, Eland Hall, Ponteland, Northumberland.
Glasgow: Dr. G. L. Pillans, 301, Albert Drive, Pollokshields, Glasgow, S.11.
Edinburgh: Dr. J. N. Hay, 85, Warrender Park Road, Edinburgh.

Nova et Vetera

AN EARLIER "BRITISH MEDICAL JOURNAL"?

It has commonly been supposed that this *Journal* was the first and only publication to bear the title *British Medical Journal*, which it assumed on January 3rd, 1857, after weekly publication for seventeen years, first as the *Provincial Medical and Surgical Journal*, and later as the *Association Medical Journal*. It is more than doubtful whether any earlier *British Medical Journal* ever saw the light of print, but that such a periodical was contemplated at the end of the eighteenth century we now know. The evidence is to be found in a printed prospectus put out by R. Phillips, printer and publisher, of No. 71, St. Paul's Church-Yard, London, at the close of the year 1798. This interesting four-page leaflet was given to Dr. Arnold Chaplin, Harveian Librarian of the Royal College of physicians, by the late Editor of this *Journal*, Sir Dawson Williams, some time before his death in February, 1928, and Dr. Chaplin has now handed it to us for preservation at the headquarters of the British Medical Association.

The Prospectus of 1798

The leaflet begins with the announcement "On the 1st of February, 1799, will be published, price two shillings, elegantly printed on fine Demy Paper, octavo size, containing at least Six Sheets of Letter-Press, and embellished with One or Two Plates, to be continued monthly, Number I, of a New, Useful, and interesting Periodical Work, intitled the BRITISH MEDICAL JOURNAL; containing the Earliest Information on Subjects of Medicine, Surgery, Chemistry, Pharmacy, Botany, and Natural History." Then follows a quotation from Cicero:

Ex Medicina nihil oportet utare proficisci, nisi quod ad utilitatem corporis spectat, quoniam ejus causâ est instituta.

An outline of the "objects which form the basis of the present undertaking" is prefaced with the following general observations.

"Magazines and other Periodical Works have lately been generally adopted, as vehicles of useful knowledge, more extensive in their effect than any other species of publication. That others are however still wanted to supply the Medical Department of literature, is a fact which has long been obvious to every inquisitive observer. There is at present no Monthly Journal in the English language, the professed and single design of which is to communicate accounts of every new Observation and valuable Discovery made from time to time in the different branches of Medicine; and still it must be confessed, that an *early circulation* of intelligence so essential to the practitioner, as well as to society in general, has not been attended to, in this country, with the care which the importance of the object required.—The present undertaking, therefore, is intended to exhibit a compendious view of all such matters of fact as lie and remained scattered, at present, through a vast number of expensive voluminous publications, as well foreign as domestic, and which deserve to be more generally known to the Medical Practitioner. Considering the importance and rapid progress daily made in Chemistry, Natural Philosophy, and other sciences connected with Medicine, it becomes matter of just surprise, that no effectual plan has hitherto been adopted, to furnish the British Public with an accurate Analysis of all the Novelties and Improvements which continually appear in various countries and languages. To accomplish this desirable purpose, and more fully to illustrate the principles of a science, on the due cultivation of which our enjoyments and our existence so materially depend, is the primary and especial object of the BRITISH MEDICAL JOURNAL; a work which, though intended chiefly for the use of the Faculty, will convey such a variety of practical and interesting information, as cannot fail to prove acceptable to every class of readers."

Outline of the Plan

Then follows an outline of the plan comprehending the objects to which the attention of the editors would be principally directed.

I. Essays on the most important subjects of Medicine, considered with respect to the Origin, Prevention, and Care of Diseases in General.

II. Every recent Improvement and Discovery in Botany, Chemistry, Pharmacy, and other medical sciences; accurate accounts of new Remedies, whether they are such as have acquired reputation superior to their merit, or such as deserve to be more generally known and employed.

III. An abridged view of the prevailing Epidemics of the season; a narrative of their usual progress; directions for the proper diet and regimen to be observed by the patient; together with the most successful method of treating the disorder, agreeably to the state, habit, and constitution of the individual.

IV. Impartial histories of the most celebrated Patent and other Quack Medicines, and critical investigations of their pretensions.

V. Remarkable and authentic Medical cases, communicated by corresponding Practitioners in all parts of the world, and occasionally extracted from foreign Medical Journals.

VI. Geographical Descriptions of Countries and Places, written chiefly with a view to appreciate their relative salubrity in point of climate, air, and situation; their local diseases and remedies; their population, mortality, etc.—Speculations upon the defects subsisting in the Medical Police of this and other countries.

VII. A Review of all new Publications in the various Departments of Medical Science, and a comprehensive *Catalogue Raisonnée*, with occasional extracts of characteristic and striking passages.—Under this head will be compressed the substance of every valuable publication, as far as the Practice of Medicine is concerned.

VIII. All the new Appointments of Physicians and Surgeons in the Navy, Army, and Public Hospitals.—Accounts of Lectures given in the different Branches of the profession, as well in London as in Edinburgh and Dublin.—Lists of Deaths occurring in the medical world.—Biographical Sketches of eminent Medical Characters living and deceased, native and foreign.

IX. Monthly Tables of the Variations which take place in the Wholesale Price of Drugs, and other articles employed in Medicine; hints and cautions how to detect the frequent Adulterations of such substances.

X. Original Communications to the Editors;—Notice of Medical Works in hand, or in the Press—of new Establishments, etc.

The prospectus ends with a plea for the support of the public, and principally of the medical faculty, for this projected monthly journal, and a warning that it "can admit neither fanciful hypothesis, nor abstruse speculations; but conjectures which possess the merit of ingenuity and novelty will not be excluded; as they frequently have a tendency to suggest hints in other respects valuable, and which may be applicable to useful purposes."

The last page of the leaflet advertises "new and interesting works," mostly non-medical, published by R. Phillips or in the press.

Reports of Societies

CLINICAL IMMUNITY

Presidential Address by Sir William Willcox

At the first meeting of the session of the Medical Society of London on October 12th Sir WILLIAM WILLCOX was inducted to the chair, and proceeded to deliver an address on the subject of "Clinical Immunity."

The clinical aspect of immunity, he said, could only be ascertained by long experience and careful observation. To bring about a true perspective close co-operation of laboratory and clinical workers was essential. In acute illness, very often, life hung in the balance, and a straw might turn the scales. Immunity, raised or lowered by a dose of vaccine or serum or a drug, might determine the issue. In cases of this kind the motto "safety first" should be predominant. Immunity might be defined as the increased resistance of the cells and tissues to the effects of absorption of foreign substances, bacterial, parasitic, virus, toxaemic, or chemical in origin. A term much in vogue to-day was "allergy"; he would define it in two words—"negative immunity." Varieties of immunity included natural immunity, which might be racial or individual, and acquired immunity, either from previous infection or brought about by artificial means. In active immunity protection was effected by the inocula-

tion with the specific infective organism, as occurred in prophylactic inoculation against typhoid, cholera, plague, and scarlet fever; whereas passive immunity was an artificial immunity where preformed antitoxins were injected into the circulation, as with tetanus or diphtheria antitoxin, scarlet fever or anthrax antiserum, and the serum from convalescent patients, as in measles or poliomyelitis.

Modern Aspects of Artificial Immunity

After a short historical account of inoculation, the early vaccination controversies, and the later work of Pasteur, Sir William Willcox turned to modern aspects of artificial immunity. Prophylactic inoculation for the production of an active immunity had its most successful application in the case of typhoid fever. Large doses of organisms were given, but care was necessary where the subject was known to be allergic, when smaller and more graduated and spaced doses might be necessary. Prophylactic inoculation and active immunity had been applied with success in scarlet fever and diphtheria. This method of immunity was essential in the case of such persons as nurses and attendants at fever hospitals.

Oral administration of vaccines had been employed for prophylactic use with some success in typhoid, cholera, and dysentery, where enormous doses were used; but in other fields oral administration had not been so successful. In America intravenous administration of vaccines was sometimes adopted for bringing about immunity, and in this country it was employed to produce protein shock.

Prophylactic passive acquired immunity was of relatively short duration, a few weeks only, and had proved of great value to those exposed to infection from diphtheria or scarlet fever, or with a wound involving the risk of tetanus. As regards immunity from measles, serum from convalescent patients was certainly of value. It had been used in a great many cases at the fever hospitals to vaccinate contacts who had been in the same room as the child with measles. Even though the person was incubating measles, if the convalescent serum was given up to the sixth day the disease was greatly modified and much milder.

On giving serum for the first time it was necessary to inquire, if it was a foreign serum like horse serum, whether the person had had serum before and whether there was any evidence of allergy, such as urticaria. A very rare danger from serum was anaphylaxis, the patient dying within two or three minutes of the administration of the serum. A type of reaction which generally occurred was serum fever; on about the sixth day there was a rise of temperature, lasting a day or two, sometimes longer, with pains in the joints and urticarial rash. It was best not to give serum to patients who were allergic if it could be avoided. He had seen three deaths in exophthalmic goitre after serum had been given for streptococcal throats. On the sixth day, when the serum fever occurred, these patients had a temperature, they had hyperthyroidism, and the fever was followed by cardiac disturbance and death.

Immunotherapy

Sir William Willcox next turned to the subject of immunotherapy, where artificial immunity was induced in a patient suffering from active disease. Passive immunity might be produced by a serum containing the specific antibodies. He wished to emphasize the value of anti-streptococcic serum, haemolytic or polyvalent, according to the type of infection, in cases of acute arthritis, where there was a temperature. If anti-streptococcic serum was given in these cases the temperature nearly always went down to normal, and treatment could be continued with the use of vaccines.

The speaker drew attention to something which he believed was new. Sometimes, where there was an extreme allergy, it might be dangerous to give serum subcutaneously or intravenously, and futile to give vaccines, because these would make the patient worse. The rectal administration of antiserum had been used by him in a considerable number of cases, and in some the results had been dramatically successful. Some 10 or 20 c.cm. of the serum was mixed with 5 oz. of normal saline and administered per rectum, a rectal wash-out having been given two hours previously. The serum was given in this way daily for three or four days. No serum reaction or fever ensued, and there was no risk whatever in this procedure. Another method of dealing with cases which were allergic and in which it was impossible to give vaccines or sera was to administer small doses of immunized blood, about 10 c.cm. intravenously, the blood being that of a donor of the same group who had been immunized by the infecting organism, generally a streptococcus.

Finally, he referred to vaccine therapy or active immunity induced in cases of active disease. The work of Sir Almroth Wright and the late Captain S. R. Douglas had placed vaccine therapy on a quantitative basis. He was a great believer in vaccine therapy, though he fully realized that this form of treatment had passed through a phase of discredit and disrepute. The reason for this was that clinical immunity in active disease was a most delicate process, and required very judicious handling with a careful study of each individual case.

There were three factors to be considered before vaccine therapy was undertaken: (1) allergy; (2) focal infection, for vaccine therapy would be useless until the focal infection had been cleared up; and (3) symbiosis, a combination of two diseases producing an enhanced clinical picture, requiring the other disease to be dealt with before vaccine therapy could be employed with success. The best results from vaccine therapy were obtained from an autogenous vaccine made from the specific infecting organism. Stock vaccines were of great value for establishing prophylactic immunity, but their value in cases of active disease was not comparable with the beneficial results of an appropriately graded dosage of an autogenous vaccine. There were hundreds of much-vaunted preparations on the market which were said to establish immunity in any case of illness, whatever the infection. Their employment was unscientific, and, although in some cases apparent benefit resulted, there was a risk of breaking down the delicate immunizing mechanism with harmful therapeutic results.

On the proposition of Dr. R. A. YOUNG, seconded by Dr. G. DE BEC TURTLE, a hearty vote of thanks was accorded to Sir William Willcox for his address.

PSYCHIATRIC APPROACH TO ALCOHOLISM

The seventeenth Norman Kerr Memorial Lecture, which was delivered by Professor D. K. HENDERSON on October 13th before the Society for the Study of Inebriety, consisted, essentially, of an appeal for the application of psychiatric methods and technique to the elucidation of the causation and treatment of alcoholism.

Professor Henderson said that the psychiatry required must be of a dynamic type, with complete recognition of the fact that alcoholism was a disease or illness, a reaction or response to the actual circumstances of the patient's life. Alcoholism was not a crime or misdemeanour to be treated by police court methods, but rather an inadequate and dangerous subterfuge which required the most skilful investigation and analysis. The argument was advanced that no real difference existed between cases of alcoholism and other forms of disorder of behaviour which were termed psychotic or psychoneurotic. The alcoholic was not a being apart for whom special or separate supervision or legislation should be necessary. The fact that he had been differentiated and specialized was one of the reasons why he had always considered himself more privileged than others.

A Problem of Mental Hygiene

The lecturer suggested that with a little more elasticity of our existing laws adequate provision could be made for cases of alcoholism long before they had been allowed to proceed to states of mental deterioration. If the patient was non-cooperative, and if it was obvious to any fair-minded person that the patient was proving a serious

menace to himself, his fortune, and his family, then compulsory methods of supervision and treatment were justifiable just as for other types of mental illness. This could be accomplished if the present lunacy laws—archaic both in name and in form—were transformed into mental health laws, which would be more comprehensive in scope than lunacy laws and have an entirely different connotation. The problem was no doubt much more complicated and difficult than it sounded, but a great step would be taken and the whole position would be made infinitely easier were there general acceptance—among both the medical profession and the public—of the view that alcoholism, in any shape or form, was an illness which not only required skilled treatment, but also the earnest co-operation of all interested in human betterment. Numerous case records were utilized whereby the individual, familial, and racial wastage which at present ensued was clearly illustrated.

The real point of attack, said Professor Henderson in conclusion, was not alcoholism as a vice, but the disposition or personality of the individual who used it to excess. While it was admitted that in many cases a strong hereditary predisposition might exist, yet that was not accepted as an excuse for the acceptance of alcoholism in a deterministic way. Alcoholism was something which could be worked with, a problem of mental hygiene to be attacked long before the child was born.

ACUTE DIARRHOEAL DISEASES IN INFANCY

At a meeting of the Royal Medico-Chirurgical Society of Glasgow on October 2nd Dr. J. W. S. Blacklock and Dr. Stanley Graham of the Royal Hospital for Sick Children opened a discussion on acute diarrhoeal conditions in infancy.

Dr. J. W. S. BLACKLOCK, summarizing the findings of a joint investigation into infantile diarrhoea with Dr. K. J. Guthrie, stated that the two main causes of acute diarrhoea in infants were gastro-enteritis and dysenteric ileo-colitis ; the primary type of the former was more severe than that secondary to some focal or diffuse inflammatory condition. No specific aetiological factor had been discovered in the case of primary gastro-enteritis, though Dr. Blacklock regarded as significant the high incidence of coliform bacilli found in this disease in the upper coils of the small bowel, which were normally sterile. Improper feeding, leading to imperfect or absent gastric secretion, with resulting loss of the normal acidity, had been thought to play an important part in favouring the occurrence of coliform bacilli in the small bowel, and their presence in this situation was possibly the cause of the profound toxaemia frequently associated with gastro-enteritis. The pathological changes—namely, the lesions in the bowel—were sometimes very slight in comparison with the clinical severity. The degenerative changes in the liver, kidneys, and heart were briefly discussed. In the liver various degrees of damage amounting at times to focal necrosis were observed. In the ileo-colitis cases only Flexner and Sonne strains had been isolated from the faeces, the former type of infection being on the whole of greater clinical severity. Difficulty had been experienced in isolating the specific organism from the stools, except in the early stages of the disease, although at times dysentery bacilli had been recovered from the bowel mucosa at necropsy. Various types of inflammatory change had been found in the lower bowel—for example, acute catarrh and membranous or ulcerative colitis, often associated with lymphadenitis. Specimens of these different lesions were demonstrated. Lastly, the typhoid-paratyphoid group of infections was shortly discussed. In view of the fact that they might run a mild, atypical course in infancy, with consequent danger of being overlooked, it was considered important that an early bacteriological diagnosis should be made. The speaker had found that such cases constituted a dangerous source of infection in a children's institution.

Dr. STANLEY GRAHAM said that the summer peak of infantile mortality due to diarrhoea had now been replaced by a winter peak due to respiratory infections. Nevertheless, in Scotland some six hundred infants under the age of 12 months had died last year from diarrhoeal diseases, mainly gastro-enteritis and ileo-colitis. Ileo-colitis was now recognized as an infection due to a dysentery bacillus ; it gave a characteristic clinical picture with blood, mucus, and pus in the stools. It was endemic throughout the child population in the same way as was meningococcal meningitis, and from the records of the admissions to hospital seemed to be on the increase. About gastro-enteritis, especially its aetiology, there was still considerable difference of opinion. Reviewing the evidence in favour of infection rather than of dietetic error, it appeared that infection was the more likely, although the nature of the infecting agent had so far escaped detection ; dietetic errors must often be considered as contributory, nevertheless. The mortality from ileo-colitis was much less than from gastro-enteritis, due in part to the fact that gastro-enteritis occurred in a younger age group than ileo-colitis. One other important factor influencing mortality was the state of nutrition. Many instances of gastro-enteritis occurred among marasmic infants, and was very often a terminal event. Infants under 70 per cent. of their expected weight showed a mortality of 65 per cent., whereas in those of normal weight for their age it was 28.5 per cent. Gastro-enteritis seldom occurred in breast-fed infants, and rarely in infants up to weight for their age and living under reasonably good hygienic conditions. Stress must therefore be laid on these factors in the prevention of the condition.

The Midland Mental Pathological Society held its fifth general meeting in the Birmingham University on October 1st. Mr. F. A. R. STAMMERS gave an address on intracranial surgery, illustrated by charts, *x*-ray photographs, and a number of cases. The cases also successfully illustrated his own method of rib grafting into large skull deficiencies. He remarked upon the uselessness of waiting for the classical signs of brain tumour (vomiting, headache, and papilloedema), which really indicated impending death, emphasizing the importance of earlier diagnosis. Sir GILBERT BARLING then gave an interesting account of his own pioneer experience with brain surgery. He showed a large brain tumour successfully removed over forty years ago, and a tumour containing pieces of shrapnel which, even after three years, were surrounded by beads of pus. He also demonstrated a case he had successfully operated upon for brain tumour twenty-six years ago.

Scotland

Treatment of Mental Illness

Speaking at the opening ceremony of the extension to Hawkhead Mental Hospital, Glasgow, on October 8th, Dr. Aidan G. W. Thomson of the General Board of Control for Scotland said that minor forms of mental illness which never required hospital treatment were probably as common as tonsillitis or a sprained ankle. There were a number of dispensaries in Glasgow for treatment of such minor mental ailments, but there were not nearly as many as there should be, and he did not think that the public realized the necessity for them. Provision had been made by the Town Council of Glasgow for the treatment of graver forms of mental disease, but it was to be hoped that attention would next be directed to extending the services for the treatment of minor ailments. Councillor Stewart Reid, convener of the Health Committee of the Town Council, said that there had been a lack of bed accommodation at the mental hospitals, and the Board of Control had been pressing Glasgow Town Council to increase its programme, not because lunacy was increasing, but because inmates of these institutions now lived much longer than they did fifty years ago. The 200 beds which were now being provided by this extension would permit development in the treatment of mental disease. A nurses' home with 124 bedrooms and dining and recreation halls had also been provided at a

cost of £28,000, while the four wards of the extension had cost £78,000.

At the annual conference of the Scottish Association for Mental Welfare, held in Dundee on October 10th, Dr. W. M. C. Harrowes, Edinburgh, in an address on mental hygiene in everyday life, said that the adolescent's difficulties of emancipation were the expression of a rebellion of which the seeds had been sown in childhood, and a clear realization of this helped to the understanding of the problems of the adolescent. Much inadequate health was due to nervous causes, which might appear as frank neurosis, or might simply upset homes and cause inefficiency in work. A symptom common to all neuroses was a fear that the condition might produce mental derangement, and consequently neuroses should be treated in hospitals distinct in every way from institutions dealing with obvious mental derangement. Such hospitals unfortunately did not exist in this country, and therefore they should look forward to the establishment of clinics with accommodation for in-patients where these cases might be treated. Such organizations, in association with general hospitals adequately staffed and with a number of paying beds, would soon justify themselves financially.

Health and Maternity Problems

At the inaugural meeting of the Glasgow School of Social Study and Training Professor E. P. Cathcart discussed the health policy of the future. Referring to the social aspect of health policy, he said that there had been tremendous advances in the health of the community in the past fifty years, and the placing of the development of communal health in the hands of trained experts had been thoroughly justified. Maternal fatigue was a very real handicap to the women of the community, but he deplored the indiscriminate practice of birth control by individuals who gave no thought to the wider issues involved. One of the main objects of the health policy of the future must be a still more intensive education of the young combined with an attempt to make maternity safer. There was a real danger in the continued harping upon the six women out of every 1,000 who died in childbirth. While an active campaign should still be conducted against the causes of maternal mortality, more attention might be paid to the 99.4 per cent. of women who did not die. This constant reference to the pathology of pregnancy simply engendered fear without doing any good.

At the opening of a maternity extension to the Vert Memorial Hospital, Haddington, on October 8th, by the Countess of Wemyss, Dr. E. C. Fahmy, Edinburgh, said that the more nearly a maternity block approached to the private house in quietness, comfort, and homely atmosphere the more gratifying was its work. This appeal was strengthened by the knowledge that each woman entering such a hospital was placed in the hands of a trained nursing staff, and yet at the same time remained under the direct supervision of her own family physician. That was one of the great advantages of a local hospital equipped for maternity work as contrasted with the large central hospital. The extension consists of two wards with an isolation ward, a new sterilizing room for the present theatre, and a waiting room for out-patients.

Opening of Lennox Castle for Mental Defectives

Lennox Castle, which dates from 1837, and is situated in the Blane Valley, ten miles to the north-west of Glasgow, has recently been reconstructed by Glasgow Town Council as an institution for mentally defective persons, and the opening ceremony was performed on September 24th by the Lord Provost of Glasgow, Mr. John Stewart. A sum of £1,250,000 has been expended by the Public Assistance Committee of the corporation on this scheme, which will provide a home for over 1,000 mental defectives, with a staff of 300. The estate consists of 1,222 acres, and was purchased in 1927 by the Glasgow Parish Council. The two main sections of the building provide accommodation respectively for 600 male and 600 female patients in forty dormitory blocks, the latter being single-story buildings with two side wards each intended for two sick patients, and a day-room facing south. Attached to each of the main sections is a refectory block with a dining hall for 600 persons and kitchen, laundry, etc. The inmates will do the work of the institution under trained supervision. Workshops for the men will produce metal articles, rugs, and garments, and there will be boot-repairing and other handicrafts, while dress-making, rug-making, and similar employment will be found for the female patients, who will also do the work of the kitchen and laundry. There are facilities for recreation, including a recreation hall with accommodation for over 1,200 persons. Bailie John Forman, convener of the Public Assistance Committee, speaking at a luncheon after the opening ceremony, said that this scheme was the first big experiment of its kind in Scotland. Many reformers of past days had dreamed of such an institution, but it had only been rendered possible by the passing of the Mental Deficiency and Lunacy (Scotland) Act of 1913. It was now the duty of local authorities to take charge of boys and girls who had attained the age of 15 or 16 and had been certified by the education authority to be incapable of receiving education. The local authorities could only do this if they had the necessary accommodation. Their primary duty was to assist the mental defectives, and they felt that in this they were entitled to the assistance of the British Medical Association. Many specialists had devoted a great deal of time to isolated cases, but doctors as a whole had been inclined to look upon the matter as something which was "round the corner" from them and which had not yet been reached.

England and Wales

Sir Arthur Hall's Portrait

Sir Arthur J. Hall, emeritus professor of medicine in the University of Sheffield and consulting physician to Sheffield Royal Hospital, was formally presented last week with his portrait in oils. This has been painted by Mr. Ernest Moore and subscribed for by Sir Arthur Hall's former students in the Sheffield School of Medicine, medical colleagues, and members of the general public. The Bishop of Sheffield, who presided at the ceremony, recalled the very large part played by Sir Arthur in the foundation of the school of medicine at the University. Professor A. E. Barnes and other speakers paid tribute to his work for the University and the voluntary hospitals of Sheffield. In his acknowledgement Sir Arthur said that he would like the presentation portrait to hang in the school of medicine at the University. This offer was gratefully accepted by the council at its meeting on October 9th.

Health Week in Leeds

Leeds, in common with a number of other centres throughout the country, began on Monday, October 5th, a health week, organized by the local committee for social hygiene and health, under the chairmanship of Dr. Edmund Welch, past-president of the Yorkshire Branch and past-chairman of the Leeds Division of the British Medical Association. The *Yorkshire Post*, in an article on the Leeds Health Week, estimated that propaganda in the form of talks and lectures by experts in schools, workshops, factories, and clinics would reach at least one in six of the city's population, to say nothing of appeals through the agency of the film. In all, there were as many as 160 lectures and talks. Sir Henry Brackenbury gave two addresses during the week, one to a large after-luncheon meeting of business men, and another to students at the Medical School of the University of Leeds on October 5th. Mr. Arthur Greenwood, M.P., formerly Minister of Health, also addressed a meeting. Fifty talks on maternity and child welfare matters were given at welfare centres during the week.

First Aid in Chemical Warfare

The British Red Cross Society has arranged two courses, each comprising eight lectures and practical work, followed by an examination for the society's certificate, on first aid in chemical warfare for doctors and trained nurses. The first course begins on Wednesday, November 18th, at 8 p.m., and will be continued on Mondays and Wednesdays at 8 p.m. The examination will be held on December 16th. The second course begins on Tuesday, January 19th, 1937, at 8 p.m., and will be continued on Tuesdays and Fridays at 8 p.m. The examination will be held on February 16th. Particulars of the courses and application forms may be obtained from the Matron-in-Chief, British Red Cross Society, 14, Grosvenor Crescent, S.W.1.

Unregistered Nursing Homes

The Minister of Health, Sir Kingsley Wood, has sent a communication to local authorities asking them to review the arrangements made by them under the Nursing Homes Registration Act, 1927, for the registration of nursing homes, in order to make sure that the existence of any unregistered homes will be brought to light with the least delay. It is an offence, as Sir Kingsley Wood pointed out in a recent speech, to carry on a nursing home which has not been registered with the appropriate local authority, and it is the duty of the latter to keep under careful observation the nursing homes registered in its area, and to see, so far as possible, that they are carried on in a responsible and satisfactory way. A nursing home which, in contravention of the law, escapes registration escapes supervision, and the purpose of the recent circular is to remind local authorities of an important part of their duties. It is suggested that local authorities can best achieve the desired object by enlisting the co-operation of the doctors who might come to hear of nursing homes in the course of their duties; by arranging for advertisements in the Press to be scrutinized by their own officials; and by making full use of the services of their visiting and inspecting officers, such as health visitors and sanitary inspectors.

Manchester Jewish Hospital: Nurses' Hours

The board of management of the Manchester Victoria Memorial Jewish Hospital has decided to introduce a forty-eight-hour week for nurses, which will come into operation as soon as the additional nurses required (some fifteen to twenty) have been engaged. The trustees of the Bernhard Baron Fund have given £5,000 to the hospital to pay for the building of an additional wing to the nurses' home to accommodate the increase in personnel. It is estimated that the new system will involve an extra annual expenditure of £800.

CORRESPONDENCE

Testimonial to Dr. Guy Dain

SIR,—In December last Dr. H. Guy Dain decided to relinquish the chairmanship of the Insurance Acts Committee, and his numerous friends and colleagues feel that the time is opportune for some suitable acknowledgement, in which all could join, of his great services to the medical profession during the past twenty years.

Dr. Dain is best known for his tireless efforts to improve the national health insurance system and to advance the interests of those practitioners who participate in that service. For nineteen years he has been a member of the Insurance Acts Committee, and for eleven years was its chairman, while for five years he presided over the Conference of Representatives of Local Medical and Panel Committees. His intimate knowledge of insurance practice, combined with a capacity for sound judgement, has resulted in a demand upon his services to which he has never failed to respond. He was one of the Association's witnesses before the Royal Commission on National Health Insurance, and he has recently been elected to the chairmanship of a joint committee which is considering ways and means of effecting an extension of the scope of medical benefit to include consultant and specialist services. In Birmingham he has been no less conspicuous in this branch of medical politics, having occupied the chair of the Local Medical and Panel Committee and the Birmingham Insurance Committee for a long period.

Dr. Dain's activities on behalf of the profession are so well known that it is not necessary to enumerate them here, but they serve to indicate the high regard in which he is held by his colleagues.

Dr. Dain's consent to the inauguration of a Testimonial Fund in his honour has been obtained, and he has expressed a wish that the amount subscribed shall be utilized for the purpose of assisting the education of sons and daughters of medical practitioners who are in need of such help. That such an object is worthy of generous support none will deny, and the signatories to this appeal sincerely hope that the response will be such as to show Dr. Dain the extent to which his self-sacrifice and devotion to the profession's interests are appreciated.

Subscriptions are invited from all members of the profession, and in view of Dr. Dain's intimate association with national health insurance medical practice, a special appeal is being made to panel committees. The fund will be open until June 30th, 1938, by which date it is hoped that a substantial sum will have been subscribed, the interest from the investment of which will enable the trustees to make a number of annual grants in the fulfilment of Dr. Dain's wish.

Cheques should be made payable to the honorary treasurer of the Dain Testimonial Fund (Dr. G. C Anderson) and forwarded to B.M.A. House, Tavistock Square, W.C.1.—We are, etc.,

P. V. ANDERSON (Shildon, Co. Durham).
S. E. A. ACHESON (Belfast).
HENRY BRACKENBURY (Hendon).
J. A. BROWN (Birmingham).
F. A. L'E. BURGES (Birmingham).
J. J. DAY (Sandwich, Kent).
D. ELLIOT DICKSON (Lochgelly, Fife).
A. FORBES (Sheffield).
W. J. GARBUTT (Birmingham).
D. G. GREENFIELD (Rushden, Northants).
E. A. GREGG (London).
H. C. JONAS (Barnstaple).
E. KAYE LE FLEMING (Wimborne, Dorset).
E. LEWIS LILLEY (Leicester).
PETER MACDONALD (York).
G. MACKIE (Wellington, Shropshire).
R. G. MCGOWAN (Manchester).
L. J. PICTON (Holmes Chapel, Cheshire).
H. ROSE (Wendover, Bucks).
W. E. THOMAS (Ystradd-Rhondda, Glam).

October 9th. *Executive Committee.*

Substances Promoting Cell Growth

SIR,—Dr. Joseph Needham's writings are always stimulating, and I always read his papers with interest and profit. But I must join issue with him when he says in his paper in the *British Medical Journal* of October 10th on "Substances Promoting Normal and Abnormal Growth" that "we know now of many substances, some of which may be naturally produced in the living body, which give a strong stimulus to the uncontrolled growth of malignant cells." I do not know of any substance, whether produced in the body or not, which stimulates the uncontrolled growth of malignant cells. I do not even know

whether Dr. Needham means exactly what he says or whether he means something entirely different. Unfortunately he does not mention a single substance by name which has this property. As the point is one of fundamental importance for our understanding of the problem of malignant growth, I hope I may be allowed to discuss it in some detail with a view to eliciting an explanation from Dr. Needham.

I presume that the substances referred to by Dr. Needham are the so-called carcinogenic substances, such as benzpyrene, methylcholanthrene, oestrin, etc. These substances stimulate the growth of *normal* cells, with the result that the tissue on which they act becomes hyperplastic. In this hyperplastic tissue, in which the growth is still controlled, one cell, or a small group of cells, undergoes a transformation from a normal cell to a malignant cell. When once a normal cell has undergone this transformation and become malignant, its growth becomes "uncontrolled," to use Dr. Needham's term. Malignant cells thus produced can then be removed from the animal in which they have originated, and can be kept alive by passages through normal animals for an indefinite period of time. They continue their uncontrolled growth without any further application of the carcinogenic agent. There is no evidence whatever that the carcinogenic agent plays any part in maintaining their uncontrolled growth. On the contrary, all the experimental evidence is against it; and it is certainly not correct to say that the uncontrolled growth of these cells can be stimulated by these carcinogenic agents. Whatever it is that drives on the malignant cells to their uncontrolled growth resides within the cells. From the evidence of the filterable tumours one can postulate, as a working hypothesis, that it is a chemical substance, just as one can postulate that it is a virus; but if it is a chemical substance it is entirely different in its properties and in its mode of action from the carcinogenic agents. In any case the existence of such substances is at present purely hypothetical, and this group of hypothetical substances does not seem to be referred to by Dr. Needham in the sentence quoted above.

It is, of course, possible that what Dr. Needham really meant was that there are many substances which stimulate the growth of normal cells in such a way that eventually the uncontrolled growth of malignant cells results. But such an interpretation does not seem to fit in with the general trend of his argument. Moreover, I am afraid that the misconception of a malignant cell as a normal cell continuously stimulated to uncontrolled growth by carcinogenic agents applied from without is very prevalent, especially among biochemists.—I am, etc.,

W. Cramer,

Queen Square, W.C., Oct. 9th. Imperial Cancer Research Fund.

Incidence of Deafness

Sir,—We are endeavouring to obtain information on the incidence of serious deafness in youth and adult life, or that degree of deafness which makes conversation either difficult or impossible and may lead to the loss of employment. So far as we know, no figures relating to the whole population are available in this or any other country; but it has been suggested to us that possibly some of your readers may be able to give us useful information on this subject concerning particular areas, groups, or trades. If so we shall be very grateful for any information on the incidence of serious deafness, even if it refers only to limited numbers of persons, or for any direction to the sources of such information, whether at home or abroad.—I am, etc.,

A. J. Story,

105, Gower Street, W.C.1, Oct. 7th. Secretary, The National Institute for the Deaf.

Hexamine in the Treatment of Biliary Infections

Sir,—Mr. C. Jennings Marshall has allowed his "spirit of philosophic doubt" to lead him seriously astray in his letter to the *Journal* of October 3rd (p. 692). What justification has he, because he himself failed to detect formalin in the bile drained from the common duct in his sixteen cases, for ignoring all the evidence hitherto published to prove that hexamine is excreted in the bile and acts as a powerful biliary antiseptic?

In 1908 Crowe found formaldehyde in the bile in a number of patients with biliary fistulae, as well as in dogs and rabbits, after the administration of hexamine, and in 1911 Chauffard obtained the same result in five patients upon whom cholecystectomy had been performed. In 1923 Knott recovered formaldehyde by distillation from the gall-bladder bile of guinea-pigs killed an hour after the administration of 3 grains of hexamine, and from the bile obtained through a duodenal tube from five patients of mine who were receiving a nightly dose varying between 20 and 90 grains. He further showed that the direct addition of hexamine to bile led to the inhibition of *B. coli* and *B. typhosus*, both of which multiplied more rapidly in bile to which no hexamine had been added. In addition to these experiments, the results of which were published in the *Guy's Hospital Reports* for 1923, Dr. Knott has repeatedly demonstrated the antiseptic action of hexamine given to patients of mine with cholecystitis or cholangitis in doses of 100 grains three times a day with sufficient alkali to keep the urine constantly alkaline. The bile obtained through a duodenal tube by Lyon's method before treatment contained large numbers of *B. coli* and occasionally other organisms such as *B. typhosus*, together with excess of mucus, columnar epithelial cells, pigment granules, and sometimes leucocytes, whereas a few days after the termination of a six-weeks course of treatment the bile was completely sterile and all the abnormal constituents had disappeared. At the same time the patient had lost his symptoms and the gall-bladder tenderness had disappeared.

Mr. Jennings Marshall states that cholecystitis is commonly dependent upon obstruction which would prevent bile from entering the gall-bladder, and regards this as a further proof that hexamine can be of no value as a biliary antiseptic. This is doubtless true in the severe cases of cholecystitis which commonly reach the surgeon, but in the much more common "medical cholecystitis" there is no obstruction, as a normal gall-bladder shadow is obtained with cholecystography. I have often pointed out that hexamine is useless for the treatment of cholecystitis if there is no shadow of the gall-bladder after cholecystography and no dark bile can be obtained by duodenal drainage. It is none the less invaluable for the severe cholangitis which may occur as a complication of gall-bladder operations, and for the milder form of cholangitis which often leads to the persistence of symptoms after cholecystectomy has been performed for cholecystitis.—I am, etc.,

New Lodge Clinic, Oct. 5th. Arthur F. Hurst.

Sir,—If I am not mistaken, formaldehyde combines immediately with any amide which it meets; it is therefore natural that Mr. C. Jennings Marshall should not find it in the presence of proteins and other amides in the cases he mentions. This reaction is apparently the reason of its destructive effect when liberated in the presence of infective organisms.—I am, etc.,

Shepton Mallet, Oct. 11th. F. J. Allen.

Cervical Gland Tuberculosis

Sir,—The article on tuberculous cervical adenitis by Dr. B. C. Thompson in your issue of September 19th seems to have opened once more the floodgates of controversy upon this old debating ground. Dr. Thompson, speaking as a physician, upholds the merits of general hygienic and conservative methods, and will have no truck with surgery, while Drs. Orley and Nicholas follow a week later vaunting the merits of rays various—gamma, *x*, or ultra-violet—and are even less acceptant of the surgeons. Far be it from me to make such wide claims for my art as they for their rays, but I feel that surgery must put up some defence.

The main arguments adduced in favour of the thesis that surgery is unjustifiable in this condition (Dr. Thompson must forgive me if I do not quote his words or figures, as I have not his article available at the moment, and this letter must catch the mail to-night) are that the results are uncertain, recurrences frequent, surgical scars very unsightly, and paralyses not unknown; that the percentage of cures by conservative methods is as great as, or greater than, that by excision; and that even if the period of treatment is longer (Dr. Thompson speaks of, I think, weekly attendances at a clinic over a period of months or even years), the time and money expended on these is more than compensated by the ultimate results. Now I would not for one moment maintain that every case of tuberculous cervical glands should be treated surgically, but I do most emphatically maintain that there are a certain number of cases for which operation is the method of choice. Such cases are those in which the glands have actually broken down, preferably before but particularly when a discharging sinus is present, for spontaneous cure by calcification of a cervical gland is exceedingly rare—I am not at all certain that it ever occurs.

As to the surgical technique, it is imperative that an adequate operation be done. To scrape blindly down a fistula with a sharp spoon is not only inefficient surgery, it is dangerous surgery. To make a small incision and evacuate a superficial abscess is little better. The great vessels of the neck must be exposed and dissected clean of enlarged glands from the base of the skull to the clavicle, the posterior triangle must be dealt with as carefully as the anterior, and the spinal accessory nerve must be defined as the first step in the dissection. Given these desiderata there will be no recurrences, no paralyses, and the time of hospitalization should not exceed seven days. Moreover, if the incision is made in a fold of the skin, if the skin edges are protected from infection, if fistulae are excised, and if the wound is sewn up carefully in layers, a perfect scar can be obtained which is practically invisible after six months. Broad, puckered, adherent scars are not the result of efficient surgery, but of inexpert surgery or of sinuses secondarily infected and ultimately persuaded to heal. There are a number of children about in Somerset who have been operated upon by me during the past ten years, and who can prove my contention. But—and I say it in all humility—the operation is not one to be undertaken by the occasional surgeon, or by any other unless he has the anatomy of the neck at his fingers' ends, is prepared to go on until he has removed *every* enlarged gland, and will take an infinity of pains to produce a good scar. It is, I believe, one of the most difficult operations in the whole field of surgery to do really well, but the results in suitable cases more than compensate for the trouble taken to acquire the ability.—I am, etc.,

New York, Oct. 6th. E. Miles Atkinson, F.R.C.S.

Sir,—It is not surprising that surgical treatment for cervical gland tuberculosis has still some supporters, because there is no doubt that in patients where the glands are discrete and the resistance good excision properly carried out will frequently effect a cure. It is, however, my considered opinion, after over twenty years' service at tuberculosis clinics in a large industrial area, that these cases only represent a small proportion of the total number. From time to time I have sent several patients to general hospitals for surgical treatment of this condition, and many who have received such treatment at the instigation of their own doctor have attended my clinics after their operation. On the whole the results that I have seen have not been satisfactory; patients have often returned with large, imperfectly healed scars and underlying swelling, showing that the attempt to remove the tuberculous material had been unsuccessful. In other cases the occurrence of keloid scars has been noted.

It is perhaps unnecessary here to discuss the question why operative treatment, when carried out in a busy general hospital, is so often unsatisfactory. Fortunately, the introduction of actinotherapy, and particularly the use of the carbon arc lamp, has provided a valuable and more efficient mode of treatment than operation for the majority of cases. For several years I have been treating most of my cases of cervical gland tuberculosis with artificial light treatment, combined with aspiration of softening glands, and incision where necessary. The results have been extremely good, and have been published (*Lancet*, May 30th, 1931, and *Tubercle*, February 1935). In these papers it was shown that during the period 1927 to 1933 270 cases of cervical gland tuberculosis received a course of artificial light treatment, and of those who completed a satisfactory course of treatment 188, or 98 per cent., were discharged as quiescent. At the end of 1933 it was decided to make an investigation into the after-results of those discharged as quiescent during the period 1927 to 1930, as these cases had then been under supervision for a minimum period of three years and a maximum period of six years. The figures showed that of seventy patients traceable on December 31st, 1933, sixty-seven, or 95.7 per cent., were still quiescent. These results occurred for the most part in patients with extensive adenitis, and the scarring was much less than is usually found after operation.—I am, etc.,

George Jessel,
Consultant Tuberculosis Officer,
Leigh, Lancs, Oct. 10th. Lancashire County Council.

Sir,—In the interesting discussion on the treatment of tuberculous cervical adenitis I notice Dr. Orley alone recommends ultra-violet ray therapy, and he combines it with *x* rays. I would whole-heartedly advise that all cases in the first instance be subjected to sunlight treatment, and as early as possible. It is simple, speedy, and at the same time markedly improves the general tone and resisting power of this type of patient.

Some ten years ago one of my daughters developed a chain of cervical glands, some of them as large as small tomatoes. I showed her to my friend Mr. Seymour Jones of Birmingham, the throat and ear specialist, who happened to be calling. He at once said "Operation," and very kindly offered to remove them for me. (I may say here that earlier she had been a pulmonary tuberculosis "suspect," and a radiograph, whilst showing nothing definite, suggested enlarged mediastinal glands.) I told Mr. Seymour Jones I was going to cure them with ultra-violet rays, and he said "Good luck to you." After seven, or thereabouts, exposures of my tungsten arc lamp, of increasing intensity (mercury vapour was not then as much in vogue as now), the glands com-

pletely disappeared; there has been no recurrence, and she is to-day a normal healthy woman. To complete the story, Mr. Seymour Jones, who chanced to meet my daughter at a dance some four months after the "cure," asked her "who had done the operation."

May I go further and advocate the trial of ultra-violet therapy in all persistent cervical and thoracic glandular enlargements? I can, in my practice, look back on remarkable results that I have obtained in chronic purulent bronchitis in old people by longer courses of artificial sunlight. I allude to the long-standing cases with intercurrent attacks of respiratory distress, raised temperature, and severe general malaise, which suggest an added *mediastinal gland infection*. These cases, often considered incurable, I have completely restored to health by careful graduated ultra-violet medication of the whole chest—front, back, and sides. I have not had occasion to give more than twenty-four sittings, though in one severe case of an old lady whose chest completely cleared insisted on a course of ultra-violet ray treatment each year as "a touch down for safety."—I am, etc.,

C. Martin Mitchell,
M.R.C.S., L.R.C.P.

Carterton, Oxon, Oct. 11th.

Plastic Operations for Hydronephrosis

Sir,—Mr. Hamilton Bailey is in error when he states in his paper on plastic operations for hydronephrosis (October 3rd, p. 669) that "as far as one can judge" this line of treatment has been abandoned by surgeons in this country, as well as in most others. A few years ago Professor von Lichtenberg of Berlin gave a practical demonstration of his plastic operation at one of the special hospitals in London. His technique was a delight to watch.

It has been my custom for many years to practise conservative surgery in hydronephrosis, and there are probably a number of urologists in this country who have been doing the same thing. The technique to be adopted is dependent upon the extent of the disease, and the one described by Mr. Hamilton Bailey is not suitable for all cases.—I am, etc.,

Clifford Morson.

London, W.1, Oct. 8th.

Nutrition and Orthopaedics

Sir,—I notice that in an address on nutrition, published in the *Journal* of September 26th, and read by Sir Robert McCarrison at Oxford, the report is given of a supposed cure of a case of spondylolisthesis by nutritional treatment.

As an orthopaedic surgeon I am fully appreciative of the great importance of the science of nutrition in my work. For the sake of scientific accuracy, however, I do think that it is necessary to draw attention to the fact that the case mentioned by Sir Robert McCarrison, and which was reported by me in the *Proceedings of the Royal Society of Medicine*, 1935, page 1370, still has spondylolisthesis according to the radiological evidence available. The latest skiagrams demonstrate the infraction of the laminae and the forward displacement of the body of the fifth lumbar vertebra characteristic of the condition. In reporting a cure I think it is necessary to make quite clear what has been cured. In this case I have no doubt that the malnutrition present has disappeared. The associated bony lesion, however, was still there when last studied radiologically. It is quite possibly not giving rise to symptoms at the moment.

A case of this sort illustrates well the need for distinguishing words for two phenomena at present covered by the one word "cure." Symptoms may disappear with or without treatment while an underlying structural lesion remains *in statu quo*. Conversely, and not infrequently I fear, a structural lesion may be "cured" and the symptoms remain.—I am, etc.,

Norman Capener.

Exeter, Oct. 6th.

Sir,—The statement made by me as to the cure of a case of spondylolisthesis (*Journal*, September 26th) by "a year's proper feeding combined with properly directed exercises," to which Mr. Capener refers in his letter of October 6th, was based on the following evidence: (1) the report of a distinguished radiologist and (2) the boy's physical fitness. The radiologist's report was as follows: "The apparent slight degree of spondylolisthesis shown in the skiagrams (28/4/1934 and 16/5/1934) seems to have practically disappeared by 9/10/1934, and to-day (28/3/1935) the spine appears normal." The boy's present physical fitness is evidenced, first, by the fact that he won the school swimming competition for boys of his class against a good field; and, secondly, by the report of a consulting physician, who recently failed to find any physical fault in him. The physician's comment was as follows: "I think he was singularly fortunate in avoiding an operation."—I am, etc.,

R. McCarrison.

Oxford, Oct. 8th.

Hallux Rigidus and Valgus

Sir,—Far from putting forward a solution to the problem of operation for hallux rigidus and valgus, Mr. G. R. Girdlestone has only complicated matters. Before his letter in the *Journal* of October 3rd (p. 693) the profession was more or less unanimous that one of three simple operative procedures—namely, the removal of the exotosis, the Kellar or the Mayo operation—would produce a most satisfactory result provided that the surgeon used reasonable judgement. We are now advised to perform an operation in which tissues which have been contracted for years are forcibly stretched and kept in tension by means of a bone peg—an appliance which I thought most surgeons had consigned to the lumber room along with bone plates and other forms of mechanized orthopaedics. All this has been recommended so that the adductors of the great toe can be preserved; even if they were powerful enough to act with any force on so firm a joint as the first metatarso-cuneiform joint their preservation in this fashion is totally unnecessary.

At the British Medical Association Meeting at Oxford in July of this year I had the pleasure of hearing Mr. Girdlestone describe this operation, which he naïvely called "the 1935 model"—a curious name for any operation. I wonder whether, like his neighbour and benefactor, he will change his model every two years. In conclusion, I would draw his attention to Mr. McMurray's article in the August 1st issue of the *British Medical Journal*, in a close perusal of which he would find an answer to most of his troubles.—I am, etc.,

W. J. Eastwood.

Liverpool, Oct. 9th.

"Bejel": Non-venereal Syphilis

Sir,—In your issue of October 3rd you have given an annotation describing the important work of Dr. E. H. Hudson on the Euphrates in French Syria. I would point out that the same disease under the same name is prevalent among the semi-nomadic Arabs on the Tigris between Mosul and the mouth of the Lesser Zab, and among the Jebour Arabs on the lower Lesser Zab itself. This region lies less than two hundred miles east of the affected Euphrates area.

I had experience of the condition while in the Iraq Health Service, on the Lesser Zab when civil surgeon at Kirkuk, and on the Tigris when civil surgeon at Mosul.

From Mosul I did some preliminary field work, which could not be followed up as I left the country shortly afterwards. The areas concerned lay some distance from hospital and out-patient departments, and necessitated special visits for study and treatment.

There has never been any doubt as to the syphilitic nature of the condition. The lesions are typical enough even apart from blood examination, and its non-venereal nature has been recognized. Only on a non-venereal basis can one explain the wholesale syphilization of a tribe free from sexual promiscuity except in laxity of divorce. The disease appeared to be a comparatively mild (bone lesions apart, which can be severe) endemic syphilis, most of the natives contracting it at one time or another. Many contract it in childhood, but quite a number contract it later. When field treatment was offered near their homes people of all ages were found to collect in large numbers for attention, often including children and adults from the same family.

Among manifestations mucous patches were very common, especially in children, and these children rarely, if at all, showed signs of the facial or general deformity of congenital syphilis. But aural mucous patches were common also in adults. Chronic ulceration of the skin came next, and then bone lesions.

The treatment adopted was intramuscular injection of aqueous solution of sod. pot. tartrate of bismuth, which was prepared in rubber-capped bottles in the hospital dispensary. It gave good results, but was apt to cause pain. Arsenical preparations, although the treatment of choice, were not used for various reasons.

It is interesting to consider that it may have been from some such endemic focus that syphilis ravaged Europe in the fifteenth century; and that probably it was largely non-venereal in its spread, as in the present case, although much more virulent.

One would like to know to what extent the freedom from serious damage to cardiovascular and nervous system or of the viscera reported in "bejel" is shared also by venereal "franghi" of the towns. My impression is that it is also less in this form, particularly involvement of the nervous system. I had the pleasure of reading only one article by Dr. Hudson—that on juxta-articular nodes, in the *Tropical Medicine Transactions* of March, 1935—so I do not know his findings in detail.—I am, etc.,

WILLIAM CORNER.

Hove, Oct. 12th.

SIR,—The accounts of "bejel" by Dr. E. H. Hudson (October 3rd, p. 684, and *Annals of Tropical Medicine*, volume xxx, 1936, p. 3) and "Z-syphilis" by Dr. Robert Napier (October 10th, p. 738) prompt me to inquire whether they have made any attempt to determine the type of treponema present. It appears to me that this "non-venereal syphilis" they describe in the Euphrates Valley and at Aden is none other than the well-known yaws or framboesia. The lesions, serum reaction, and response to bismuth and the salvarsan group of drugs are typical. It would be interesting to know what variety of treponema is present in the lesions.—I am, etc.,

HAROLD AVERY.

London, W.1, Oct. 12th.

Cod-liver Oil in External Eye Affections

SIR,—Reference to this subject in your *Epitome of Current Medical Literature* (October 10th, para. 291) prompts me to put on record the following.

A few years ago, when haliverol came into medical use generally, I saw as an out-patient in the eye department of a large general hospital a child with phlyctenular conjunctivitis, and I asked the parents to give it a few drops of haliverol daily. Some ten days later the child was brought to me again by the parents, who said that, while the eye was a great deal better, they were finding it difficult "*to put the drops into the eyes.*" Examination, made with some little trepidation, showed that the eyes were indeed improved, and obviously none the worse for what was, to me at any rate, a new and unusual method of vitamin administration.

Thereafter I was induced to try the local application of the oil in such cases as phlyctenular conjunctivitis and keratitis, chronic blepharo-conjunctivitis, indolent corneal ulcers, and in these very intractable cases of marginal corneal ulcers so often got in people past middle life, and frequently associated with carbohydrate excess. The results, while not always what one hoped for, have been so often satisfactory as to justify the continued use of the treatment. Moreover, while it is both difficult and dangerous to be definite, I myself formed the opinion that clinically the amelioration of the eye condition was quicker and more marked in the cases where the oil was administer both locally and per os than by either route alone.—I am, etc.,

A. J. CAMERON.

London, W.1, Oct. 11th.

Paravertebral Injection of Alcohol in Thoracic Aneurysm

SIR,—I would be interested to know whether the following line of treatment for the relief of intractable pain in thoracic aneurysm has been tried by other correspondents, and what results have been obtained.

The case treated by the above method was one of sacculated aneurysm of the ascending aorta (diagnosed radiologically). Severe symptoms had been present for six years, and could only be controlled by large doses of morphine. The pain distribution was over the praecordium and in the left hypochondrium, and marked tenderness on deep palpation was present two inches to the left of the fifth and sixth dorsal spinous processes. The radiologist reported that erosion of bodies of the fifth and sixth thoracic vertebrae had taken place, and organic heart disease was present. The patient could not lie on his back because of the pain, and had to sleep propped up on a bed-rest for three years.

Encouraged by the successful results recorded in angina, I decided to try paravertebral injections of alcohol, and 2 c.cm. of 80 per cent. alcohol was accordingly injected under novocain anaesthesia in and around the two upper thoracic ganglia and rami communicantes (following Labat's technique). Injection was followed by the usual sharp pain felt along the corresponding intercostal distribution, but after about five minutes a definite dulling of the precordial pain ensued and the patient was able to lie down in bed comfortably; fourteen days later he reported that he was comfortable and could sleep with the aid of 10 grains of aspirin. There was still, however, some pain over the area to the left of the fifth and sixth dorsal spines, due to the erosion and pressure on bodies of vertebrae, so I decided to give another injection to see whether the pain due directly to the aneurysmal pressure could be controlled. This was carried out opposite the fifth thoracic spine in and around corresponding ganglia and rami communicantes, and resulted in complete relief of pain; four weeks later he reported that he could sleep well lying down without any drugs at all, and was comfortable enough to get about and take an interest in life.

It would seem from this case that paravertebral injections are worthy of a more extended trial in cases of this type and other similar types of intractable pain of visceral origin which otherwise might have to be relegated to the category of incurables or else seek unorthodox treatment in the form of "spinal adjustments"!

As the needle used is very fine and one keeps close to the bone all the time, there does not appear to be much risk from puncture of the sac or other important structures provided one keeps on the left side, as Learmonth suggests. —I am, etc.,

Farnham, Oct. 6th. CHARLES JOYNER.

Gastrogenous Polyneuritis

SIR,—Dr. A. H. Douthwaite's paper on gastrogenous polyneuritis in the *Journal* of September 12th (p. 535) prompts me to record a similar case which I had under my care for six years.

The patient was a woman aged 59, who was first seen in 1928. She had just returned from Switzerland, where she had been treated for tuberculous cervical glands. She had some fibrosis of the right apex, was obviously anaemic, had albuminuria and a blood pressure of 135/70, and complained of intense lassitude. In 1931 weakness had increased, and there was profuse pyuria with sterile culture. Her blood urea was 50 mg., and she was thought to have a tuberculous kidney. Increasing weariness occurred during the next two years. In 1932 I have a note to the effect that there was weakness of both legs and both arms; both knee-jerks were present, and there was a ? extensor response on the left side. She slept well and had a good appetite; her complexion was lemon-coloured, and her blood pressure was 150/70. The blood count was normal, and the pathologist reported no sign of actual or pernicious anaemia. The report of the sugar-tolerance test was: "Sugar tolerance is poor, the curve is not typical of diabetes, but the fasting level is far from being regained in two hours.".

At this time she was seen by the late Dr. Batty Shaw, who in a characteristic communication stated that he could not understand "why a woman with sterile pus in her urine should have such a widespread muscular palsy; biceps, triceps, flexors and extensors of both forearms, extensors and hamstrings of both legs, the tibiae and gastrocnemii are all affected. The picture recalls some form of muscular dystrophy, but whether primary or secondary I cannot state." Investigation by Dr. Batty Shaw revealed a complete achlorhydria. A guinea-pig test of the urine was negative for tuberculosis. The blood count was substantially the same, no abnormality of red blood cells was found, and the colour index was 0.98. A skiagram of the chest showed enlarged glands in the left hilus, with paralysis of the left diaphragm. A later fractional test meal showed some secretion of free acid after the first hour. Liver in various forms, iron, and hydrochloric acid were given without any material effect. There was increasing weakness and disability.

In the later stages of her illness the knee-jerk on the right side was absent and on the left side very much diminished. In the summer of 1934 she had symptoms of acute intestinal obstruction, and the question of malignant growth arose. This crisis was overcome and the patient died in September of that year, with no further abdominal signs or symptoms. Her blood examination in the late summer of 1934 showed a red cell count of 2,720,000 per c.mm., with a haemoglobin index of 0.42.

Reviewing this case in the light of recent research, it would seem probable that it was one of gastrogenous polyneuritis.—I am, etc.,

Worthing, Oct. 7th. R. C. HUTCHINSON.

Mechanized Medicine

SIR,—Perhaps the difference between the practice of Dr. Mackenzie and that of "Juvenis's" principal lies not in the superior morality of the one practitioner, but in the type of panel patient each encounters. A reasonable panel patient who obeys his doctor's instructions, who takes care of himself sensibly, and who therefore can be treated satisfactorily, is in some districts the rule and in others the exception.

Many panel patients are irresponsible individuals unfit to enter into a contract with a doctor. These time-wasters and the low capitation fee cause some dissatisfaction with the national health insurance service. Is the extent of this dissatisfaction known? Prosperous practitioners occupying prominent positions are unlikely to be dissatisfied, and tend to discourage admission of misgivings by their less fortunate professional brethren. Could not a confidential questionary be sent to every panel practitioner, so that the truth may be discovered? —I am, etc.,

Llanbradach, Glam., Oct. 10th. WILLOUGHBY CLARK.

SIR,—I am subject to considerable trepidation in having evoked so formidable an adversary as Dr. Alfred Cox; yet I regard his entry into the argument as a tribute to the force of my criticisms, which, as Dr. Cox reluctantly concludes, I make in all sincerity.

If Dr. Cox reads my letter aright he will see I was protesting against the "snobbery" which distinguishes panel from private, though I believe it is commerciality. The snobbery is on the part of private patients, who, for instance, dislike sharing a waiting room with panel patients. And that is part of the problem; for with strong "opposition" in the district one dare not offend rich patients who want adulation, or panel patients who like to be sufficiently ill to be "on the club." These are the ones who "clutter up" my surgery.

In panel practice, as I see it, many a one can draw sick pay by being just a little ill; and many a one continues to be convalescent when a man without insurance would make himself resume work—purely because the struggling G.P. cannot afford to antagonize patients. Of course, glaring cases of "swinging the lead" are treated summarily; but many minor ones succeed.

Then there is the other side of the picture. Dr. Cox's figures fit in fairly well. My panel patients constitute about 50 per cent. of the total; but the rest are not all private, many are parish and family club patients. The error in Dr. Cox's calculations which Dr. Porritt points out is so self-evident that it is often forgotten. But to my mind Dr. Porritt is too niggardly in his timings. A *good* examination in the surgery takes considerably longer than five minutes. Can anyone examine a man for life insurance in five minutes? Moreover, in a practice like this, covering a scattered area of some thirty square miles, fifteen minutes per visit is too low an average of time consumption. Indeed, it is very difficult to find time and energy to read and think about my patients. And even when I do, economic considerations often restrict me to the palliative bottle of medicine. Indeed, I wonder if panel treatment is intended to be more than symptomatic. Of about one hundred formulae for misturae in the *N.H.I. Formulary* some fourteen are "cough mixtures"! How many dyspeptics can afford artificial teeth? How can one get a walking calliper for a fractured neck of femur? How can one treat the host of psychopathic cases when neither the patient's approved society nor the regional medical officer seems to care a jot about treatment?

As for the point raised by another correspondent—namely, inadequate remuneration—judging from things I have seen as a locumtenent in the past some panel doctors get more than the remuneration they deserve; but I realize such men are probably exceptions.

I must crave a little further space to protest against the remarks of Dr. Mackenzie. As I have already stated, my original letter was the outcome of a genuine feeling of dissatisfaction due to my belief that under present circumstances I am not allowed to do enough for those of my patients who are genuinely ill, and that I dare not be honest with many who are not. I fail to see why this should give any Jupiter Borealis Fulminans the

right to impugn my diagnostic ability (is cancer of the stomach not insidious in Ross and Cromarty?), or to draw a parallel between me and the inhabitants of Dartmoor. That is but a step from condemning to prison all who dare to criticize the panel system. It is at least comforting to feel that should any patient be rash enough to come here from Tain his record card will contain much more than the illegible half-line entries of hieroglyphics we usually see.

To sum up: In my opinion the panel system was a great advance; but British complacency has come to regard it as a magnificent and final achievement instead of as a very incomplete attempt to improve the nation's health and comfort.—I am, etc.,

October 10th. JUVENIS.

SIR,—Many readers must have derived considerable amusement and interest from the recent discussion on mechanized medicine. Many, also, must have been dismayed by the intellectual dishonesty and fatuity shown by certain correspondents. I refer in particular to the egregious utterance which ends on a note of righteous satisfaction, claiming that the arguments of "Juvenis" will be treated with the contempt they deserve. Such statements are liable to recoil a hundredfold on their utterers, especially when, as in this case, they educe no arguments whatever.

I venture to suggest that an overwhelming amount of disease in panel patients, even more than in other patients, is due to malnutrition, bad housing, poverty, and lack of fresh air, sunlight, exercise, and the reasonable enjoyments and happiness of life: in short, to a faulty environment. Accordingly, the rational method is to build up a right environment as far as possible. The extent to which this can be done depends on the financial resources of the patient. To pretend that panel and well-to-do private patients can be treated identically is to be an ostrich. Unpleasant facts must be faced. Much national health insurance practice consists of futile efforts to adapt the patient to a wrong environment by generous doses of drugs and other poisons. We are in a changing era. Public and private health are slowly merging. Perhaps in the meanwhile the national health insurance practitioner is doing useful work which will be facilitated by the gifts of hypocrisy or self-deception.—I am, etc.,

London, W.14, Oct. 9th. GEOFFREY G. SHERRIFF.

SIR,—While it would be unfair to stigmatize the whole profession for the misdeeds of a few of its members, nevertheless there is, I believe, an increasing tendency to practise what has been described in previous letters as mechanized medicine. For this the public are in part to blame. In this aspirin-ridden age pain must be assuaged, discomfort eased forthwith and at any price, and the excuse that one may be trying to cure the case is not always received with becoming gratitude. On the other hand, there is a type of mind—present in all ages of medicine—who will choose the easier path. They have so simplified prescribing as to resemble the famous John Brown of the eighteenth century, who divided all the ills of mankind into two categories: (1) the depressed, who required stimulating, and that with alcohol; (2) the over-excited, who must be soothed, and that with laudanum. Few of the modern school, one fears, are as honest as John Brown, who, believing in the efficacy of his own prescription, died of too much alcohol by day and too much laudanum by night!—I am, etc.,

London, N.7, Oct. 12th W. L. TEMPLETON.

*** With these four letters out of many received we must close the correspondence.—ED., *B.M.J.*

The Prescribing of Glucose

SIR,—It has for some years been realized, largely as a result of the teaching of H. C. Cameron and others, that a certain number of children suffer from various symptoms which can be attributed to acidosis and hypoglycaemia, and such children are benefited by a fat-restricted diet and the addition of glucose. One feels sometimes, however, that there is a danger of this excellent treatment being "overdone" in some quarters. One sees so many children who have been ordered glucose for conditions in which there would appear to be little or no evidence of acidosis or of hypoglycaemia—in my own experience many children of the poorer classes have a diet which tends to be excessive in carbohydrates and deficient in fat and protein—and one wonders why the addition of a few teaspoonfuls of glucose should be regarded as likely to be beneficial.

Secondly, is there any scientific evidence that "glucose" is superior to ordinary sugar? "Glucose" is expensive, whether provided by a hospital or by the parent. Is there any justification for prescribing it if, as I believe, equally good results can be obtained by advising extra sugar and the addition of honey, golden syrup, etc., to the diet?—I am, etc.,

October 6th. T. W. PRESTON, M.D., M.R.C.P.

Chlorine-free Diet

SIR,—The question of a salt-free diet is of such practical importance that I trust you will permit me a little space to draw attention to some of its features.

As we know, the effect of common salt upon the human organism is not yet quite clear, but a few facts seem to be established: (1) Animals on a mixed vegetable and meat diet do not need salt at all, since sufficient sodium chloride is already contained in their daily food. (2) Salt-taking is an acquired taste (many primitive tribes have no word for "salt"). (3) Most people take an excessive quantity of sodium chloride, amounting to about 20 lb. a year when 2 lb. would suffice. This over-indulgence of table salt is used both in cooking and at meals. We are all familiar with the irritating effect of salt, whether taken in the form of food or condiment, upon skin conditions.

Of the two factors in common salt—sodium and chloride—it would seem that the chloride radical is the one that puts the greatest strain on the kidneys. According to Bunge, tissue cells in general swell and shrink, as do the blood cells, with changes in the salt content of the fluid bathing them, and suffer if such changes are too great. There is a constant ratio between the salt content of the fluid in the tissues and the salt content of the blood. In glomerulonephritis we know that the kidney function can be carried on for a long period with impaired organs, and it is in such cases that salt restriction is so indicated. One sees many patients with raised blood pressure, but showing no gross lesions of the organs, in whom blood urea is increased, specific gravity of urine is lowered, with a trace of albumin but no casts or reduction in volume; these cases go on for many years, but are very careful and restricted in their salt intake.

The question of salt restriction is important relative to slimming; one does not want to increase the appetite or diminish diuresis. A trip to South America this year demonstrated to me that those who developed oedema of the feet and ankles during the great heat cleared up quicker when the temperature dropped, and the abnormal skin activity ceased when the salt intake in all forms was reduced.

The field of the salt-free diet is fairly large, and, while good cooking with attractive flavouring helps, "Hand me

the salt" is one of the first requests as a rule heard when sitting down to a meal. Many medical men hesitate to order a salt-free diet because a salt flavour is to most people inseparable from the enjoyment of eggs, salads, and other articles of diet which need the savour of salt to render them palatable. Therefore it is necessary to offer something in the way of a substitute. I have found that a squeeze of lemon gave a little flavour to the food, but in my experience, having tried most of the substitutes, I find "ruthmol" the most popular with the patients.—I am, etc.,

London, Oct. 8th. GRAVES STOKER.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

At a congregation of the Senate, held on October 1st, Mr. G. H. A. Wilson, Master of Clare, resigned the office of Vice-Chancellor and was reappointed. In his address reviewing the events of the year, he made reference to the numbers of undergraduates studying medicine in the university. "There is one problem which must sooner or later receive attention and which has already caused serious difficulty in the departments concerned with medicine. There is nothing at present which the University can do to limit the number of undergraduates accepted by the colleges in any particular branch of study. Although within recent years extensive additions to nearly all the buildings of the departments associated with medicine have been made, the accommodation for teaching is proving inadequate owing to the large increase in the number of medical students; this is particularly felt in the Department of Biochemistry. It is not easy to suggest a solution, but it seems clear to me that some system must be devised which will place a limit upon the number of those accepted by colleges, whether in medicine or any other subject. Unless something is done the situation may easily become one of even greater embarrassment than already exists."

During the months of August and September the title of the degree of B.Chir. was conferred by diploma on Mrs. S. L. Bhatia (Girton), and that of M.B. on M. C. A. Robson (Newnham).

The forthcoming course of lectures on modern developments of science 1895-1936 includes a lecture on November 6th by Professor G. H. F. Nuttall, on tropical medicine and parasitology; on November 13th by Professor John A. Ryle, on medicine; and on November 27th by Professor J. B. S. Haldane, on genetics and evolutionary theories. These lectures, which are open without fee to all members of the University and of Girton and Newnham Colleges, will be delivered in the lecture room of the Physiological Laboratory at 5 p.m.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examination indicated:

DIPLOMA IN PUBLIC HEALTH.—J. D. Bryan, Nancy L. Lewis, G. McLoughlin.

UNIVERSITY OF SHEFFIELD

At its meeting on October 9th the University Council appointed Dr. R. Platt honorary lecturer in medicine and Dr. A. E. Naish medical officer to the Training Department.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

A meeting of the Council of the Royal College of Surgeons of England was held on October 8th, with the President, Sir Cuthbert Wallace, in the chair.

Mr. J. A. Ward of Wigan Technical College was admitted as the seventh Macloghlin Scholar.

A resolution of condolence was passed on the death of Lord Moynihan.

Mr. E. P. Stibbe of the London Hospital was elected to the Board of Examiners in Anatomy and Physiology for the Primary Fellowship Examination.

The annual report of the College was approved and adopted.

The President reported the award of a Sir Gilbert Blane Gold Medal to Surgeon Lieut.-Commander J. M. Sloane, R.N.

Diplomas of Fellowship were awarded to Harold Francis Mowat (Toronto) and John Eber Spalding (Guy's).

Stanley Mitchell Sangster of Epsom College was elected the forty-fourth Jenks Scholar.

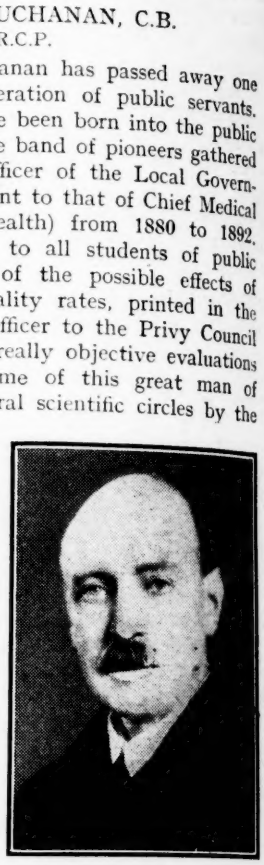
It was reported that Mr. Cecil P. G. Wakeley and Professor A. G. S. Huggett had agreed to examine for the Primary Examination for the Fellowship which is to be held overseas next year.

Obituary

SIR GEORGE S. BUCHANAN, C.B.

M.D., F.R.C.P.

With Sir George Seaton Buchanan has passed away one of the last of a famous generation of public servants. Buchanan may be said to have been born into the public service. His father, one of the band of pioneers gathered round Simon, was Medical Officer of the Local Government Board (the post equivalent to that of Chief Medical Officer of the Ministry of Health) from 1880 to 1892. His work should be familiar to all students of public health literature; his study of the possible effects of sanitary measures upon mortality rates, printed in the ninth report of the Medical Officer to the Privy Council in 1867, was one of the first really objective evaluations of sanitary reforms. The name of this great man of science is perpetuated in general scientific circles by the Buchanan Medal, conferred by the Royal Society on workers in the field he cultivated.



The son, George Seaton (whose second name recalls his grandfather on the maternal side, Dr. Edward Seaton, another hero of ancient days), was born in 1869, and entered the public service within four years of graduation (he graduated M.B.Lond. with a gold medal in 1891 and became M.D. in 1893); he retired under the age limit in 1934. From 1895 to 1900 he served as a medical inspector of the Local Government Board, and had experience of practically all branches of the medical work. He provided one of the first proofs of the conveyance of typhoid fever by oysters (Clacton, 1898), and was engaged for nearly two years on work arising out of the discovery of arsenical poisoning due to beer. This led to his promotion to be Chief Inspector of Foods, an office he held for two years, when he reverted to the general medical staff and became successively second and first assistant medical officer. In 1914 began his connexion with what was to prove his chief interest: he was appointed delegate for Great Britain to the Office International d'Hygiène Publique. In the war he gained further foreign experience and served on a special commission of experts appointed to investigate the epidemiology and sanitation of the Eastern Fronts. In 1919-20, on the establishment of the Ministry of Health, Buchanan became a senior medical officer, and had charge of the Medical Intelligence Service. Although his primary interest was in international sanitary organization, he was responsible for an immense amount of work of domestic importance, and either initiated or made practicable many of the scientific epidemiological investigations—for instance, that of cancer—carried out in the Ministry.

A mere enumeration of the posts he held, the committees and commissions upon which he served, and the reports he prepared would cover many pages. It is sufficient to recall that he served continuously at the Office International from 1914 and became its president in 1932. He was technical adviser for health questions to the British delegations at both Versailles and Lausanne, and played an important part in the Health Organization of the League of Nations from its inception. He was knighted in 1922, elected F.R.C.P. in 1925, and awarded the Jenner Medal of the Royal Society of Medicine in 1935. The mere record of a public servant's work is colourless

to those unfamiliar with its background. An attempt to describe the man at work may be more instructive than an analysis of official documents. Few officials have written better minutes and memoranda; few general readers know enough of the difficulties of the art of minuting to be judges of their excellence.

I first made Buchanan's acquaintance at the meetings of the Epidemiological Section of the Royal Society of Medicine in 1908 or 1909, and became one of his junior colleagues in the Ministry of Health in 1919—a relation which began a lifelong friendship. An entrant to the public service whose apprenticeship has been served in university or research institutions is apt at first to draw unfavourable conclusions. Superficially Buchanan did not compare favourably with scientific workers of his standing. His general scientific culture was not deep; he was not, like his father, a wide general reader, and he had no hobbies. He was an unattractive public speaker, and he *seemed* a dilatory chairman of committees. It was, indeed, easy for a beginner to think "Buch." rather a bore. Perhaps the first experience which shook that belief was to discover that committees presided over by "Buch." actually discharged their references in a shorter time and more efficiently than those managed by apparently more business-like and certainly more fluent chairmen. The illusion rocked violently when one found that (*a*) if "Buch." had not some item of knowledge in his mind he knew where to find it at a moment's notice; (*b*) he could *rapidly* digest confused and technical documents into a clear, orderly statement. The illusion was finally dissipated by realization that Buchanan had just as keen a desire to solve and as much skill in perceiving how to solve an administrative problem as any scientific worker brought to bear on his problems. One learned that the man of hesitating speech, sitting with a pile of wooden matches beside him, an incredibly ill-made and inefficient cigarette in one hand and a pen in the other, was an artist. All of us who provided him with raw material and watched the evolution of the finished product will recognize that truth. But there was something more.

Buchanan, like all other men, had his foibles: he enjoyed success; he took pleasure in appearing at an international gathering as the representative of His Britannic Majesty's Government; he was possibly overconscious of his representative function as a servant of the Crown, both at home and abroad. He was never able to forget that Great Britain was a different place from the Continent of Europe, inhabited by different people. He may even have sunk so low, in the apprehension of our younger intellectuals, as to think of the inhabitants of other countries as "foreigners." These were, no doubt, limitations. But "to imitate the outward appearance of certain virtues is like imitating the clothes of a certain class. It does not make us belong to the class to dress like it." Perhaps in this very limitation was rooted the supreme excellence of Buchanan which won the affection and unswerving loyalty of those who worked with him. "Catoni autem quum incredibilem tribuisset natura gravitatem, eamque ipse perpetua constantia roborasset, semperque in proposito susceptoque consilio permanisset. . . ." The Roman virtue of *constantia*—which a good scholar has suggested is not a bad equivalent for the English virtue of being a White Man—was Buchanan's primary excellence. At home he never let down any of his subordinates or superiors. Abroad he never let his country down. "Foreigners" of the most seductive kind, officially important, scientifically eminent, might draw up plans for a new international hygienic heaven and earth. It might be perfectly easy to bless those plans in a few well-chosen phrases, to express a vaguely benevolent intention of co-operating, and then to do nothing whatever. It *was* easy; it was often done. Buchanan could not do it at all. His first thought was, Can *we* deliver the goods? If we *say* we will prepare statistics of this or that, or will implement this or that proposal, can we make good our promise? He would take pains to learn whether we could do so; if he got no satisfactory answer he would have nothing to do with the scheme. He would say so either in a well-written but intensely British minute or in a less well-spoken but even more British French. There was never the least doubt where he stood. He earned the steady hatred of all facile orators and the complete loyalty of all admirers of *constantia*. The line between *constantia* and *pervicacia* may be hard to draw. Perhaps Buchanan was sometimes over-suspicious of new proposals. But it will be found that the international sanitary agreements to which he was a party have been implemented, while the infant mortality rate of many schemes carried against his opposition has been high.

It is the commonest of obituary tributes to say of a man that devotion to his duty shortened his life. In Buchanan's case it happens to be literally true. He had no hobbies. I think that his happiest moments of relaxation were when sitting over a glass of wine and a pile of wooden matches in a French café discussing with colleagues what had been done to-day and how we were to make a good, honest show at the conference to-morrow. He would as soon have thought of taking exercise for the fun of the thing as of standing on his head in the Minister's room at Whitehall, and he could work until any hour of the night. That is not a healthy way of living, and the tragic death of his only son was a shattering blow. His reaction was to work, if possible, harder than before. When Buchanan reached the age of retirement his health was visibly impaired, but he looked forward to continuing some of his international work, and we all hoped that freedom from official duties would make that possible. It was not to be. His name will not go down to history in a textbook. He will not even be remembered by the general public as a "great" civil servant; his field of activity was too remote from the interests of the man in the street. But by those who worked in close association with him he will always be held in affectionate remembrance, for he did indeed strengthen their loyalty to the public service *perpetua constantia*: he was indeed a White Man.

MAJOR GREENWOOD.

To Professor Greenwood's memoir should be added a word on Sir George Buchanan's long association with the Society of Apothecaries of London, in whose work he became interested through his uncle, Sir Shirley Murphy, Chief Medical Officer of the London County Council and at one time Master of the society. Buchanan served as junior and senior warden and was elected Master in 1934, but failing health prevented him from fulfilling the duties of an office he had looked forward to holding.

When the British Medical Association held its Annual Meeting at Eastbourne in 1931 he was President of the Section of Public Health, and gave an address on "Some Recent Policies regarding Particular Diseases." An appreciation of his forty years' service to the cause of public health appeared in these columns on February 10th, 1934.

[The photograph reproduced is by the Topical Press Agency, London.]

The death is announced of Professor Reinhold Ruge, on August 19th in Dresden, at the age of 75. He enjoyed an international reputation for his work on malaria.

Professor Hugo Rex, the anatomist of the German University in Prague, died on August 13th at the age of 75.

JAMES M. D. MITCHELL, M.D., F.R.C.S.

Surgeon, Sutton and Cheam Hospital

Dr. James Murray Duff Mitchell, who died at Sutton, Surrey, on October 5th, was the son of the late Captain O. R. Mitchell, commander in the British India Line, and afterwards one of the nautical assessors at Aberdeen. James Mitchell entered on the medical curriculum at Marischal College, Aberdeen, in 1902, when 16 years old. He graduated M.B., Ch.B. in 1907, and after a period of assistantship in general practice in Edinburgh he returned to Aberdeen and graduated B.Sc., with special distinction in physiology. Shortly afterwards he gained the Cambridge D.P.H., and was appointed a school medical officer in Lincolnshire. In 1912 he graduated M.D.Aberd. while working in partnership at Brigg.

On the outbreak of war Mitchell joined the R.A.M.C., and after being posted to a stationary hospital at Malta, he applied for service in the line ; he was transferred to France, and became medical officer of the 5th Essex. A few days after joining his regiment his battalion went over the top on the Somme, and during the attack Mitchell was badly wounded on the right shoulder, neck, and both arms, wounds which resulted, through nerve injury, in some wasting of the muscles of the left arm and hand. After undergoing several operations for removal of shell fragments he served in London on the staff of the Medical Pensions Board, ultimately taking up practice at Sutton, where he was soon appointed a surgeon at the Sutton and Cheam Hospital and St. Anthony's Hospital, North Cheam. In 1926 he obtained the Fellowship of the Royal College of Surgeons of England, having persevered with the final examination while earning his living as a general practitioner and subject to many interruptions. This testing time, writes a medical friend, was no real criterion of Mitchell's knowledge of surgery, the soundness of which knowledge he demonstrated in spite of his war-wound handicap by his diagnostic and operative work both inside and outside Sutton hospitals. A very attractive man, who carried all his degrees unobtrusively, he was beloved by his fellow practitioners and by the public he served so faithfully. James Mitchell reached the age of 50 with the promise of continued brilliant surgical usefulness, but angina pectoris found in him a prey. The sympathy of all who were privileged to know her husband goes out to Mrs. Mitchell and their son, now at Haileybury College.

Dr. Charles Joseph O'Connor of Celbridge, Kildare, died recently after a long and most useful career as a general medical practitioner, during which he won the highest esteem of his colleagues as well as of his many patients and friends. He was educated in Dublin, where he received the diploma L.R.C.S.I. in 1878 ; in the following year he became L.R.C.P.I. and L.M., proceeding F.R.C.S.I. in 1889. Soon after qualification he was appointed district dispensary medical officer and medical officer to the infirmary at Celbridge, Co. Kildare, and in this neighbourhood he spent the remainder of his professional life. He was also medical officer to the Celbridge Collegiate School and Clongowe's Wood College. In 1887 Dr. O'Connor joined the British Medical Association ; he was also a member of the Irish Medical Association. The variety of his responsibilities and the wealth of his experience, associated with his innate talents, conferred upon him exceptional skill as a diagnostician and therapeutist.

Mr. Claud Edward Woakes, who died suddenly on October 7th, aged 68, had been a member of the British Medical Association for forty years. He received his medical education at the London Hospital, and obtained the diplomas M.R.C.S., L.R.C.P. in 1893. Early in his professional life he specialized in diseases of the nose, throat, and ear, and was aural assistant for nine years in the throat and ear department of the London Hospital, where also he had been receiving-room officer. Later he held the appointments of surgeon in charge of the nose, throat, and ear department of Charing Cross Hospital and senior surgeon to the London Throat Hospital, Golden Square. For some time he was surgeon captain in the C.L.V. (National Guard). Mr. Woakes was joint author of *Deafness, Giddiness, and Noises in the Head*, of which the fourth edition appeared in 1896. He published various articles dealing with such subjects as nasal polypi and the source of ear affections in infancy and childhood to medical periodicals. He was a Fellow of the Royal Society of Medicine, and had been vice-president of the Laryngological Section, and was also a member of the West London Medico-Chirurgical Society.

A veteran member of our profession, Dr. Herbert John Fausset, died on October 10th at Hopwas, near Tamworth, at the age of 90. Dr. Fausset was the son of Mr. R. D. Fausset, R.I.C., county inspector for Donegal and Armagh, and his boyhood was passed in County Waterford at the home of his maternal grandfather, Lieutenant H. J. Clifford, R.N., who had visited Napoleon at St. Helena when sailing to China. Dr. Fausset studied medicine at Trinity College, Dublin, graduating M.B. and M.Ch. in 1868, and obtaining the L.M. of the Rotunda Hospital. After serving as resident surgical officer to the Richmond Hospital, Dublin, he settled at Tamworth, and was for half a century medical officer of health for the adjoining areas in Staffordshire and Warwickshire, and medical superintendent of the Tamworth Isolation Hospital. He proceeded to the M.D. of Dublin University in 1878. Dr. Fausset was a Fellow of the Society of Medical Officers of Health, and had been a member of the British Medical Association for over sixty-three years.

Professor A. Borrel of the Faculty of Medicine of Strasbourg died recently. He was the director of the Bacteriological Institute of Strasbourg, a member of the *Conseil Scientifique* of the Pasteur Institute in Paris, and a Commander of the Legion of Honour. Of recent years he had taken the leading part in the organization of a centre for the collection and distribution of the serum of patients convalescent from measles, scarlatina, and poliomyelitis.

The Services

PROSPECTS IN THE I.M.S.

In the opinion of those well qualified to judge the situation, the Indian Medical Service holds out as good prospects for really able young graduates as it has done in the past. In particular, it seems likely that the chances of civil employment will remain as good as they now are. The type of man most needed is the specialist in medicine, surgery, or midwifery, but men who are good all round will find plenty of scope in the different branches of the Service. Men with aptitude for research will also find excellent opportunities, because research workers belonging to the Service have special advantages in adequate remuneration and security of tenure.

Those who join will be entitled to all safeguards which have been included in the new Government of India Act for officers appointed by the Secretary of State. As compared with officers who entered three years ago, they will receive some £600 more pay in the first twelve years, owing to the fact that they are promoted to the rank of captain after one year of service instead of after three years. An important point is that I.M.S. commissions are permanent from the outset, despite the fact that officers can retire with a gratuity of £1,000 after six years' service.

Those who feel doubtful about the security of the financial conditions of the Service may be referred to a letter by Lord Hailey in the *Daily Telegraph* of September 23rd, 1936. Roughly, the position is that the Secretary of State for India will have full powers for securing the rights of members of

the Service, who will thus enjoy the same general position as members of other Services of the Crown; also the Home Government can step in to regulate Indian finances if there should be any failure on the part of India to provide the necessary funds.

Full details and application forms can be obtained from the secretary, Military Department, India Office, Whitehall, London, S.W.1.

DEATHS IN THE SERVICES

Dr. Richard Hay Pulipaka, M.D., Bengal Provincial Medical Service (ret.), died in Edinburgh on October 3rd. He was an Indian Christian from South India, and was educated at Madras University, where he took the B.A. in 1883, and at Edinburgh, where he graduated M.B., C.M. in 1891, and M.D. in 1931. After qualifying he got an appointment in the Uncovenanted Medical Service in Bengal. His name was then Jadannadham, which he changed to Pulipaka, for family reasons, soon after his return to India. He held several civil surgeoncies in Bengal, in succession, Serampore for many years, Nadiya, and Gaya, and was for a time medical officer of the British Consulate at Basra. He retired about twelve years ago. He was the author of a *Medico-Topographical History of Serampore*.

Medical News

Mr. Eardley L. Holland will deliver a Chadwick Public Lecture on "Perils of Parturition to the Child: Their Nature and Prevention," at 26, Portland Place, W., on Tuesday, October 27th, at 8.15 p.m., with Sir William J. Collins, chairman of the Chadwick Trustees, in the chair.

The opening address to the Hampstead General and North-West London Hospital will be delivered by Lord Snell, chairman of the London County Council, on Wednesday, October 21st, at 3 p.m. His subject is "England and America: Their Past and Present Relationships."

The twenty-fifth annual meeting of the Guild of St. Luke, St. Cosmas, and St. Damian will be held at Preston on Sunday, October 18th, at the Park Hotel, immediately after the High Mass at St. Ignatius', Meadow Street, Preston, which will be celebrated at 11 a.m. After the meeting a luncheon has been arranged for at the hotel, price 5s. (payable at the table); ladies are invited.

Dr. E. J. Boome will deliver a lecture on "Speech Defects in Young Children," and will demonstrate relaxation methods to the Maternity and Child Welfare Group of the Society of Medical Officers of Health, 1, Thornhaugh Street, Russell Square, W.C., on Thursday, October 22nd, at 8.30 p.m. Visitors are welcome.

The twenty-fifth Long Fox Memorial Lecture will be delivered by Dr. A. Bulleid, F.S.A., on Tuesday, October 20th, at 8.30 p.m. in the large theatre of the Wills Physic Building of the University of Bristol. The title of the lecture is "Somerset Lake Villages," and admission is free.

The following lectures will be given under the auspices of the William Ramsay Henderson Trust in the Anatomy Classroom, University New Buildings, Teviot Place, Edinburgh, at 5 p.m.: October 20th, Dr. George Riddoch, "Clinical Aspects of Hypothalamic Derangement"; October 22nd, Mr. Norman M. Dott, "Surgical Aspects of Hypothalamic Disorders." Admission is free by ticket obtainable from Messrs. Wallace and Guthrie, 3, Charlotte Square, Edinburgh, 2.

A lecture on the theory and practice of contraception will be given to medical practitioners and students who have completed their gynaecological course by Dr. Gladys Cox on Friday, October 30th, at 6 p.m., at the Walworth Women's Welfare Centre, 153A, East Street, S.E.17. Demonstrations will be given on Friday, November 6th, at 6 and 7 p.m. Those attending a demonstration should bring rubber gloves. In order to help to cover expenses a fee of 5s. is charged, and those intending to come are asked to apply for tickets in advance.

A meeting of the Royal Microscopical Society will be held at B.M.A. House, Tavistock Square, W.C., on Wednesday, October 21st, at 5.30 p.m., when a paper will be read by Major H. C. Brown, I.M.S., and Dr. J. C. Broom on "Micro-cataphoresis and its Application."

A sessional meeting of the Royal Sanitary Institute will be held at Loughborough Town Hall on Friday, October 23rd, at 5 p.m., when discussions will take place on "The Administration of the Accredited Milk Scheme in Leicestershire," to be opened by Dr. J. A. Fairer, and on "Health Propaganda in Relation to the Powers and Duties of Local Authorities and Insurance Committees," to be opened by Mr. T. Crew.

Four leading women psychologists are to give public lectures at the Institute of Medical Psychology, Malet Place, London, W.C., on problems of childhood and the training of children. The lecturers will be Dr. Maria Montessori (October 27th and November 3rd), Professor Charlotte Buhler of Vienna (November 10th and 17th), Miss Lillian de Lissa of the Nursery School Association (November 24th and December 1st), and Dr. Susan Isaacs of the Institute of Education (December 8th and 15th).

A meeting of the Medico-Legal Society will be held at 26, Portland Place, W., on Thursday, October 22nd, at 8.30 p.m., when a paper will be read by Mr. C. E. A. Bedwell on "Legal Status of Voluntary Hospitals."

A conference to consider the new Midwives Act and its operation will be held by the Royal Sanitary Institute in the Central Hall, Westminster, on Thursday, October 22nd, at 2.30 p.m. Sir Kingsley Wood, Minister of Health, will preside and address the conference, and the discussion will be opened by Dr. John J. Buchan, medical officer of health for Bradford. Speakers who will take part include a county medical officer of health, a medical officer of health for a non-county borough, and a representative of the Joint Council of Midwifery. Over 500 representatives have been appointed by local authorities throughout the country to attend.

Mr. N. Bishop Harman and Dr. G. Clark Trotter are representing the British Medical Association at the annual conference of the National Smoke Abatement Society, held at the Science Museum, South Kensington, from October 14th to 17th.

The three main subjects discussed at the forty-fifth French Congress of Surgery, held in Paris between October 5th and 10th, were the results of ovarian grafts, surgery among diabetics, and the pneumonectomies.

At a meeting on September 18th of research workers and doctors in Dresden a new society was founded with the title of "Deutsche Gesellschaft für Hygiene." Its affairs will be administered by Professor Hans Reiter of Berlin.

Laboratory infection with Weil's spirochaetes in connexion with experiments on dogs and rats has recently been responsible for so many accidents, some fatal, in Germany that the Ministry for the Interior issued, on August 22nd, instructions to all medical and veterinary laboratories, enjoining on them the wearing of protective glasses and rubber gloves and the employment of serum in case of need.

By decree of the French Government a public funeral has been accorded the crew of the *Pourquoi-Pas ?* which foundered off Iceland on September 16th. Its leader, Jean Charcot, the son of the celebrated Charcot of the Salpêtrière, was born in 1867, a hospital intern in 1891, and the head of a hospital service as early as 1895. His medical career, which included bacteriological studies at the Pasteur Institute with Metchnikoff and Roux, were abandoned comparatively early in favour of oceanographic and allied studies, to which he devoted nearly all his life. In the course of an obituary address by Louis Bouvier, president of the Academy of Sciences, the speaker recalled the fact that during the great war the British Admiralty put Dr. Charcot in charge of a submarine-chaser.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

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Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

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QUERIES AND ANSWERS

A Page Turner

Dr. F. W. Burton-Fanning (Norwich) writes: "G. H." asks in the *Journal* of October 3rd if there is such a thing as an electric page turner. During the war the late Sir Arthur Shipley had numbers of wounded men in the Master's Lodge, Christ's College, Cambridge. Amongst other contrivances for their help he devised an effective instrument, which was held in the mouth, for turning the pages of a book. Mrs. Hutchinson, Master's Lodge, Pembroke College, Cambridge, could probably supply further information.

Suppression of Salivary Secretion

Mr. Archibald Smith (Jersey) writes: In your issue of October 3rd "X. Y. Z." asks for suggestions for the treatment of a case of dry mouth. May I suggest the administration of tr. jaborandi, 10 to 15 minims t.i.d., combined with some simple stomachic mixture.

LETTERS, NOTES, ETC.

Problems of Population

Dr. B. Dunlop (Putney) writes: You say that the countries of high birth rate are "almost" all countries with high death rates. I submit that every country of high birth rate has an excessive mortality. That this must be so in any long-settled country was the essence of Malthus's doctrine. As to the fear that the forthcoming decline of population will be dangerously prolonged, I remain confident that when the wave of excessive birth control reaches the poorest classes there will soon begin a wave of adequate parenthood in the other classes; paradoxical as it may seem, my chief remedy for the quantity and quality problems of population is the legalization of abortion for any woman who has had two confinements. I prophesy that before long there will be a peaceful and most profitable alliance of all the low-birth-rate countries of Europe, and also that when the Asiatics begin to reduce their wastefully high fertility there will come a prolonged boom in world trade.

Medical Aspects of the Italo-Abyssinian Campaign

In an address to the Italian Institute of Public Health on July 31st, reported in *Il Policlinico* of August 24th, Sir Aldo Castellani gave an interesting account of the medical aspects of the Italo-Abyssinian campaign. There were 1,241 cases of malaria, with twenty-three deaths, among a total of half a million men. Prophylaxis consisted in every soldier taking quinine tablets three times daily. Dysentery, which has also always been one of the scourges of war, was exclusively of the amoebic variety, and was responsible for 453 cases, but only one of them proved fatal. There were 458 cases of enteric fever with 161 deaths. No case of typhus fever occurred in the Italian troops, although this disease was rife among the Abyssinians, who also suffered considerably from relapsing fever. One case of small-pox was reported in the Italian Army, whereas there were numerous cases in the Abyssinian Army and civil population. Thirty Italians had heat stroke, with seven deaths; there was only one case of beri-beri and none of scurvy. According to reports received from the Red Cross, there were 30,000 cases of scurvy among the Abyssinian forces; in the Italian Army each soldier was given a lemon every other day. The general health of the Italian troops during the war was excellent. During the seven-months campaign there were only 599 deaths from disease, of which twenty-two were among the officers and 577 among the men; while the deaths from wounds were nearly double, numbering 1,099, of which 119 were among the officers and 980 among the men.

The Menstrual Cycle and Pregnancy

Mrs. B. E. Walters Stallard, M.D. (Hereford), writes: In the issue of your Epitome (October 10th, para. 297) there is a note on the relation between short menstrual cycles and pregnancy. In 1903 I attended a medical woman in her first confinement. The child was not born until six weeks after the time as estimated by the last menstrual period, and was apparently full term. The patient's menstrual cycle was six weeks. She said ruefully that she should never again scold a woman for not knowing when a child was expected.

Rapid Addition

Dr. F. A. Belam (M.O.H., Guildford) sends the original of the following letter received at one of the local schools at which a medical inspection was being held. He suggests it might be headed "mass production."

> "Please find enclosed Patricia Mary's medical form I regret she will be unable to appear also myself having been compelled to send her to her Grannies owning to an hourly increase in the family."
>
> **Yours truly,**

Medical Golf

A meeting of the Medical Golfing Society was held on the links at Prince's, Sandwich, on October 10th and 11th, in fine weather, and the course was in excellent order. About sixty members stayed at the Granville Hotel, Ramsgate, and were well looked after. The results of the competitions were as follows. Singles *v.* Bogey: J. L. Livingstone (3 up); Michael Smyth (2 up). Foursomes *v.* Bogey: T. P. Kolesar and G. K. Cooper (all square); G. Armitage and Carron Brown (1 down). Canny Ryall Cup: G. Armitage and Michael Smyth (tied at 72). Milsom Rees Aggregate Cup: H. W. Allott (1 down).

Gas Equipment for Laboratories

The British Commercial Gas Association's latest publication, "Modern Gas Equipment for Laboratories," describes the latest equipment of all kinds—from Bunsen burners to metallurgical furnaces, from incinerators to refrigerators, and from water heaters to incubators. Copies may be obtained free on request from the British Commercial Gas Association, Gas Industries House, 1, Grosvenor Place, Hyde Park Corner, S.W.1.

Corrigendum

A reporting error occurred in the account of the discussion on "Carbon Dioxide Absorption from Anaesthetic Atmospheres" which appeared in our issue of October 10th (p. 735). The remarks made by Dr. T. A. B. Harris, anaesthetist to Guy's Hospital and St. Peter's Hospital, were incorrectly attributed to Dr. I. E. Harries.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 54, 55, 56, 57, 58, 59, 62, and 63 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 60 and 61.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 211.